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Skeptical Inquirer

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Stardust, Smoke and Mirrors

The Myth of the Mad Genius

SYLVIA BROWNE'S PSYCHIC FAILURES: Why Does Anyone Believe Her?

Has Global Warming Stopped?

News and ESP Belief

Lost Lessons of the Strangling Angel

Electrocuting Parasites

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[FROM THE EDITOR

Wildly Wrong, Psychics Shouldn't Get a Free Pass

How is it that Sylvia Browne can be so overwhelmingly wrong in her "psychic" pronouncements and yet continue to be so popular? That isn't the focus of historian Ryan Shaffer's "The Psychic Defective Revisited" in this issue, but it is the question that naturally arises after reading his new investigative report. Shaffer follows up his 2010 SI article documenting Browne's dismal record on missing person and death cases (in 115 readings she was then mostly correct zero times). He examines one new reading and investigates new developments in eleven previously unresolved ones. Those include the Amanda Berry case where Amanda and two other girls escaped captivity in May, ten years after Browne had notoriously and tragically told her mother "she's not alive." The mother never recovered from her grief and died of heart failure in 2006.

The result of Shaffer's updated investigation? In the 116 cases considered, Browne still has never been mostly correct in a single one. She has been mostly incorrect in thirty-three. (Eighty-three cases still have unverified outcomes.) Anyone with such a dismal record in any other field would be laughed out of town. But "psychics" get a special pass because their supporters want to believe, they are swayed by charisma, and if they care about evidence at all (which is unlikely), they hear only self-serving self-reports from the so-called psychic.

One of my favorite illustrations ever in the Skeptical Inquirer was Rob Pudim's cartoon dramatizing one key way (of many) that psychics seem always to get it right. A psychic triumphantly walks away from a dartboard, one dart in the bull's-eye. That's her story. But then we see that the whole target and indeed the entire wall behind it and the desk in front are littered with scores of darts gone far astray. As long as it is the psychic who is giving the results, we'll hear only of successes. Thoughtful people have long looked to the Skeptical Inquirer to provide the "other side" of the story, the one based on actual objective examination of the evidence. To say there is a gap between the two approaches is a wild understatement.

* * *

We all know that genius and madness go together, right? Well, skeptics may know better. (Remember full moons and madness? We debunked that one long ago.) But the idea that creative people tend toward madness (or bipolar disorder in modern lingo) has considerable popular acceptance and some expert proponents. Yet it is false, a myth, as psychologist, therapist, and writer Judith Schlesinger demonstrates in her article in this issue on the myth of the mad genius. Health care professionals are often complicit in uncritically promulgating the myth, which Schlesinger has been investigating for three decades. For more, see her book *The Insanity Hoax: Exposing the Myth of the Mad Genius.*

* * *

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—Kendrick Frazier

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THE MAGAZINE FOR SCIENCE AND REASON

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Forbes' Salzberg, CSI's Nickell to Receive Balles Prize in Critical Thinking

Paul Fidalgo

Forbes columnist Steven Salzberg and author-investigator Joe Nickell will each be awarded the 2012 Robert P. Balles Prize in Critical Thinking, to be presented by the Committee for Skeptical Inquiry at the CFI Summit in October.

In the struggle against the torrent of pseudoscientific misinformation peddled to the public, there could be no more valuable ally to skeptics than rational, critical, and intellectually honest media. Unfortunately, tales of hauntings, the paranormal, and celebrity-endorsed magic "alternative medicine" cures based entirely on hearsay have proven irresistible to much of the established press and popular media.

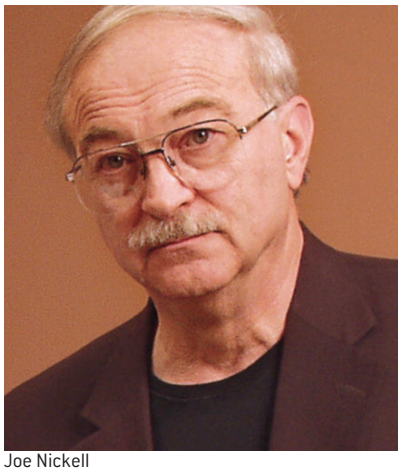
This is why the work of Steven Salzberg and Joe Nickell is so necessary.

In his column for *Forbes*, "Fighting Pseudoscience," Steven Salzberg regularly shines the light of reason on the false or dubious claims made by those hawking homeopathy, demonizing vaccines, deifying celebrity gurus, or generally denying science and reality, often at the expense of public health. He does so with a clear and accessible voice, and with a healthy dose of humor.

Accessibility and humor, along with unmatched rigor and curiosity, are what the famed Joe Nickell, CSI senior research fellow, has been bringing to his work for decades. In 2012, Nickell released his latest of many invaluable books, *The Science of Ghosts: Searching for Spirits of the Dead*, in which he explores, investigates, and exposes the many legends, myths, and hoaxes about ghosts. He gets past the mysticism and romance to examine the actual evidence for "spiritual activity," based on diligent research and hands-on investigation.

The Committee for Skeptical Inquiry (CSI) is therefore proud to give the 2012 Balles Prize to both Steven Salzberg and Joe Nickell. It is the first time two awards have been given in the same year.

Steven Salzberg



Joe Nickell

The Robert P. Balles Annual Prize in Critical Thinking is a $2,500 award given to the author of the published work that best exemplifies healthy skepticism, logical analysis, or empirical science. Each year, the Committee for Skeptical Inquiry selects the paper, article, book, or other publication that has the greatest potential to create positive reader awareness of important scientific issues.

This prize has been established through the generosity of Robert P. Balles, an associate member of CSI, and the Robert P. Balles Endowed Memorial Fund, a permanent endowment fund for the benefit of CSI. CSI's established criteria for the prize include use of the most parsimonious theory to fit data or to explain apparently preternatural phenomena.

This is the eighth year the Robert P. Balles prize has been presented. Previous winners of this award are:

- 2011: Richard Wiseman, psychologist and entertainer, for his book *Paranormality: Why We See What Isn't There*
- 2010: Steven Novella for his tremendous body of work, including the *Skeptics' Guide to the Universe*, *Science-Based Medicine*, *Neurologica*, Skeptical Inquirer column "The Science of Medicine," and his tireless travel and lecture schedule on behalf of skepticism
- 2009: Michael Specter, *New Yorker* staff writer and former foreign correspondent for the *New York Times*, for his book *Denialism: How Irrational Thinking Hinders Scientific Progress, Harms the Planet, and Threatens Our Lives*
- 2008: Leonard Mlodinow, physicist, author, and professor at Caltech, for his book *The Drunkard's Walk: How Randomness Rules Our Lives*
- 2007: Natalie Angier, *New York Times* science writer and author of the book *The Canon: A Whirligig Tour of the Beautiful Basics of Science*
- 2006: Ben Goldacre for his weekly column, "Bad Science," published in the *Guardian* newspaper (U.K.)
- 2005: Shared by Andrew Skolnick, Ray Hyman, and Joe Nickell for their series of articles in the Skeptical Inquirer on "Testing 'The Girl with X-Ray Eyes'"

Call for Nominations: There's amazing work being produced in 2013, with much more on the way. If you'd like to vouch for the author you think deserves the 2013 Balles Prize, contact Barry Karr at bkarr@centerforinquiry.net.

Paul Fidalgo is communications director of the Committee for Skeptical Inquiry.

CFI, Krauss Urge Rep. Lamar Smith to Scrap Onerous Science Funding Criteria

Science advocate Lawrence Krauss of Arizona State University and the Center for Inquiry have submitted a letter to Rep. Lamar Smith (R–Texas) calling his draft legislative proposal altering the National Science Foundation's (NSF) peer review system "both unnecessary and potentially harmful to science research supported by the United States government."

The draft bill proposed by Smith, chairman of the House Committee on Science, Space, and Technology, would require the NSF director to certify that a research project meet three new criteria before awarding a grant. It must advance national health, prosperity, welfare, or defense; it must be "groundbreaking" or solve problems of the utmost importance; and it must not duplicate other government-funded research projects. It also suggests these requirements be considered for all federal science agencies.

"These requirements represent a serious misunderstanding of the nature of scientific inquiry and discovery and, if approved, would not facilitate, but instead obstruct productive scientific research," reads the letter.

"It would burden [the NSF's] process with standards that politicize science and fail to give proper weight to the importance of basic scientific research."

The letter, sent May 16, 2013, notes that NSF's current process is based on "the time-honored and scientifically sound principle of peer review." It notes that that process evaluates applications for funding based on two main criteria: intellectual merit and societal impact.

"Your bill would not improve this process, which is widely considered to be one of the most successful science funding processes in the world and which has placed our nation at the forefront of scientific advances."

The letter notes that the proposed bill would require the NSF director to be able to predict which research will be groundbreaking. "This confuses the processes of science with prophecy. Groundbreaking discoveries are not something one can reliably foresee . . . they are often the result of basic research which did not anticipate, and was not specifically designed to result in, critical breakthroughs." It gave as examples: the World Wide Web; the field of quantum mechanics, now required for all modern electronics; and the life-saving cervical cancer screening Pap test, discovered during research into guinea pig sex cycles.

The letter is signed by Krauss, Foundation Professor at Arizona State University's School of Earth and Space Exploration and an Honorary Board Member at the Center for Inquiry (and a Committee for Skeptical Inquiry Fellow); Ronald A. Lindsay, CFI President and CEO; and Michael De Dora, director of the CFI Office of Public Policy.

CFI's full letter is available as a PDF at http://bit.ly/CFI-Krauss-NSF. Rep. Smith's draft bill is available at http://bit.ly/lamar-smithbill.

Psychic Ordered to Pay $6.8 Million for False Claims

Benjamin Radford

The owners of a Texas ranch raided by police based on a psychic's bogus information about a massacre have sued the psychic, winning a $6.8 million judgment. The case began June 6, 2011, when a psychic using the name "Angel" (later determined to be a woman named Presley Gridley) called police and described a horrific scene of mass murder: dozens of dismembered bodies near a ranch house about an hour outside of Houston, Texas. There were rotting limbs, headless corpses and, chillingly, children in a mass grave.

Deputies from the Liberty County Sheriff's office went to investigate and soon dozens of officials from the Texas Department of Public Safety, the FBI, and the Texas Rangers were on the scene—not to mention cadaver dogs, news helicopters, and gawkers.

It all turned out to be a false alarm. There were no dead bodies; the psychic was wrong (or lying). Though the incident became a national embarrassment, police refused to apologize, saying that procedures were followed and that the severity of the claims warranted an investigation. Whether a tip comes from an ordinary citizen, an anonymous informant, or a self-proclaimed psychic, information about mass murders cannot be ignored.

The ranch owners, Joe Bankson and Gena Charlton, were not so understanding and filed a lawsuit. According to the *Houston Chronicle*, "A self-described psychic who triggered a media frenzy when she told authorities a Liberty County couple had a mass grave on their property has been ordered to pay the couple $6.8 million. A Dallas County judge issued the judgment May 7 against Presley 'Rhonda' Gridley, the sole remaining defendant in a lawsuit filed a year ago."

Other defendants originally named in the suit included six major media outlets as well as the police, though claims against all the others were dropped. The lawsuit blamed the sheriff's office for repeating Gridley's claims to reporters and stated: "Over the course of the day, media defendants began to exaggerate and eventually make up facts about Plaintiffs, including that a mass grave existed on the property, including the bodies of children."

District Court Judge Carl Ginsberg found that Gridley had made defamatory statements about Bankston and Charlton when she falsely reported the massacre to the Liberty County Sheriff's Office. Ginsberg found that Gridley's statement injured the reputation of Bankston and Charlton, exposing them to public hatred, ridicule, and financial loss. The plaintiffs stated that their house was trashed in the police raid and that they had lost friends as a result of the

psychic's false claims.

That a psychic gave police wrong information about a serious crime is unremarkable and in fact routine. Following high-profile missing persons cases, police often receive dozens or even hundreds of tips from psychics, which invariably turn out to be contradictory and inaccurate. The case brings up interesting issues about responsibility for providing accurate information to police. Making a false report of a crime is itself a crime in many places, though prosecutions tend to be rare unless it's a costly and blatant hoax. Part of the reason is that police don't want to discourage potentially helpful tips from the public. As the famous post-9/11 slogan says, "If you see something, say something." Because real terror threats are rare, by definition most reports of suspicious packages and activities are false alarms. Police don't want to prosecute people who sincerely suspect something is amiss, but they also don't want to waste time and resources on hoaxes and misinformation.

What makes this case different is that it was not police that sued but rather an injured third party damaged by the psychic's information. A psychic being successfully sued for giving wrong information is unusual, and it may cause psychics to think twice about making claims they cannot back up. Of course many already advertise their services as "for entertainment only," though there is nothing entertaining about reporting to police that dead and dismembered children are on someone's property.

In Twenty-First-Century Europe, Public Prosecutor Appoints Clairvoyant as Expert Witness

Tomasz Witkowski and Maciej Zatonski

About three years ago a group of Polish scientists wrote an "Open Letter in Defense of Reason." Why? Because the Polish government had issued an official list of occupations that included such professions as fortune-teller, astrologer, and dowser but not, for example, "scientist," without realizing the legal consequences. More than five thousand people signed this letter.

An article about this in the Skeptical Inquirer (November/December 2010) noted:

> The Minister has not, however, taken a stance toward possible legal consequences resulting from individual occupations being included in the Classification. What if, for example, the Polish Supreme Court were to allow establishing a forensic expert in the area of fortune-telling, astrology, bio-energy therapy, or similar specialization on the same grounds as other forensic experts? It is only a matter of time now before a clever lawyer makes use of this provision and forces a divorce decree with the help of a clairvoyant. After all, a clairvoyant's opinion is of the same weight as, for instance, a criminologist's. I fear even to think about any other possible consequences of such decisions.

Three years later we have the first precedent. A public prosecutor has established a clairvoyant as an expert witness in a missing persons case. The clairvoyant (whose name we will not divulge) bragged about the decision of the public prosecutor on his website. He published court documents and commented: "The only document of this kind ever issued." The document appoints him as an expert witness and asks to "conduct an experiment to reveal the whereabouts of a missing person."

The clairvoyant is well-known for advertising his services by claiming his extensive cooperation with the Polish police over many years. However, the ex-spokesman of the Polish police headquarters, when asked by the media how many clairvoyants' tips were actually correct in the past decades, replied: "None."

The appointment of a clairvoyant can have far-reaching consequences. It opens the possibility for other "specialists" of this type to take part in deciding important public matters. And it shows the state's approval for magic, pseudoscience, and superstition to the public. And last, but not least, this absurdity is funded with public money.

We can only hope that other public services will not follow this precedent. Services offered by shamans, "bioenergy" therapists, and homeopaths employed by the public health service would be much cheaper than doctors, surgeons, and pharmacists. Why pay detectives if we can simply look in a crystal ball? Why spend money on DNA analysis if we can ask a fortune-teller?

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The authors wrote about the "Psychology Is Science, Not Witchcraft" campaign in our July/August 2013 issue.

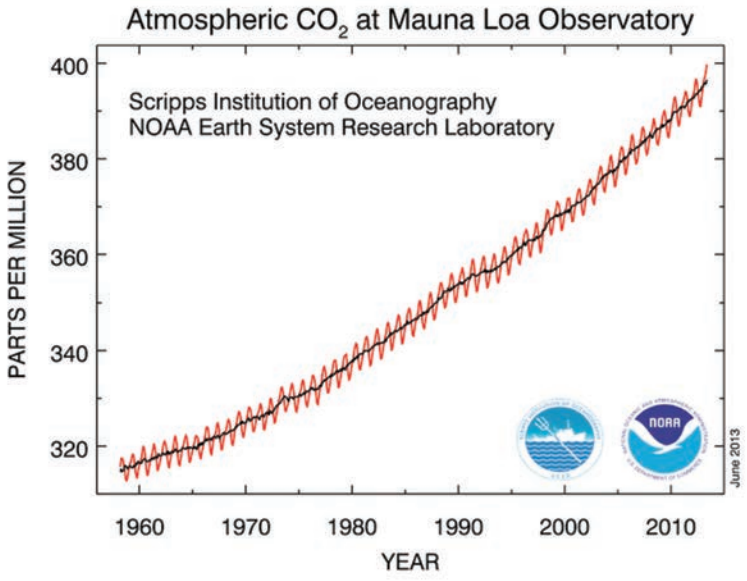
Has Global Warming Stopped?

The latest public confusion about climate change involves an apparent slowing of the rise of global temperatures. What is the reality concerning this putative temperature 'plateau'?

DAVID MORRISON, JOHN R. MASHEY, AND MARK BOSLOUGH

Human-caused (anthropogenic) global warming has been a topic of major scientific interest for more than half a century, and its consequences are broadly apparent in rising surface and ocean temperatures, dramatic changes in Arctic ice, rising sea levels, and a multitude of stresses placed on ecosystems around the planet, such as poleward migration of bark beetles killing vast forests. However, some powerful organizations dispute the reality of this climate change and the role of the greenhouse effect as its cause. In the United States, there is widespread public confusion—or even outright denial—about global warming.

A major recent source of public misunderstanding is the slowing of the rise of temperature (the so-called temperature "plateau") that is apparent in annual average global surface temperature over the past fifteen years, following rapid warming in the preceding twenty-five years. Adding to some people's bewilderment is the fact that atmospheric and climate scientists tend to downplay this supposed plateau and continue to assert that the planet is warming at a dangerous rate. What is the reality behind this divergence of opinion between scientists and their critics concerning the reality and significance of the putative plateau?



Atmospheric CO_2 as measured from the Mauna Loa Observatory since 1958. Note the small repeating seasonal variations. There is a steady overall increase from 315 to 400 ppm, and the slight upward curvature shows the acceleration in the deposition of CO_2. Carbon dioxide is the primary greenhouse gas in the atmosphere, and as such is the main driver of climate change. The increasing CO_2 greenhouse is causing an energy imbalance, with more heat added to the Earth every year. However, only a part of this excess energy goes to increase the surface air temperatures, which are also subject to a variety of other influences. Data from Pieter Tans, NOAA/ESRL (www.esrl.noaa.gov/gmd/ccgg/trends/) and Ralph Keeling, Scripps Institution of Oceanography (scrippsco2.ucsd.edu/).

Evidence for Global Warming

Before addressing the surface temperature issue, it's helpful to review the scientific case for continuing global climate change. The reality of the greenhouse effect and the implications of increasing carbon dioxide in the atmosphere have been known since the pioneering work of Svante Arrhenius in 1896. The steady increase in atmospheric CO_2 since the beginning of the industrial revolution has been monitored directly since 1959 and reconstructed for earlier years from atmospheric samples trapped in ice. In May 2013 the concentration reached 400 ppm, 43 percent above pre-industrial CO_2 levels. This increase is almost entirely caused by human burning of fossil fuels and deforestation. Basic physics tells us that the increasing CO_2 greenhouse effect will affect the temperature of the planet; the key question is by how much.

In the past two decades we have been able, for the first time, to measure the greenhouse heating and to track where the excess heat is deposited. Excess greenhouse gases trap heat in the atmosphere and reduce infrared radiation to space. The imbalance causes the Earth to absorb more energy than it radiates. Most of that energy is going into the ocean, not the surface or atmosphere. Global ocean temperatures are now measurable for the first time by the Argo deep ocean probes—an international network of more than 3,000 measuring stations that measure ocean temperatures down to two kilometers

depth. One consequence of ocean heating is sea level rise from thermal expansion of the water, now taking place at an average rate of 3.3 ± 0.4 mm per year (based on data from 1993 to 2009).

The effects of global warming are visible in many natural systems. The most dramatic changes are in the Arctic. In the Arctic Ocean, the minimum summer ice cover has shrunk by more than 50 percent, and the residual ice is only about half as thick as it was thirty years ago. The Greenland ice sheet is rapidly shrinking, as measured by satellites that sense the total mass of ice, and in the summer of 2012 it lost an astounding 500 cubic kilometers of ice. Most of the ice does not melt in place, but surface melt water lubricates the ice flow and causes much more ice to flow into the sea. The warming ocean then supplies the energy to melt this ice. There is similar ice loss in the Antarctic, primarily by erosion of floating ice shelves from below by warmer seawater.

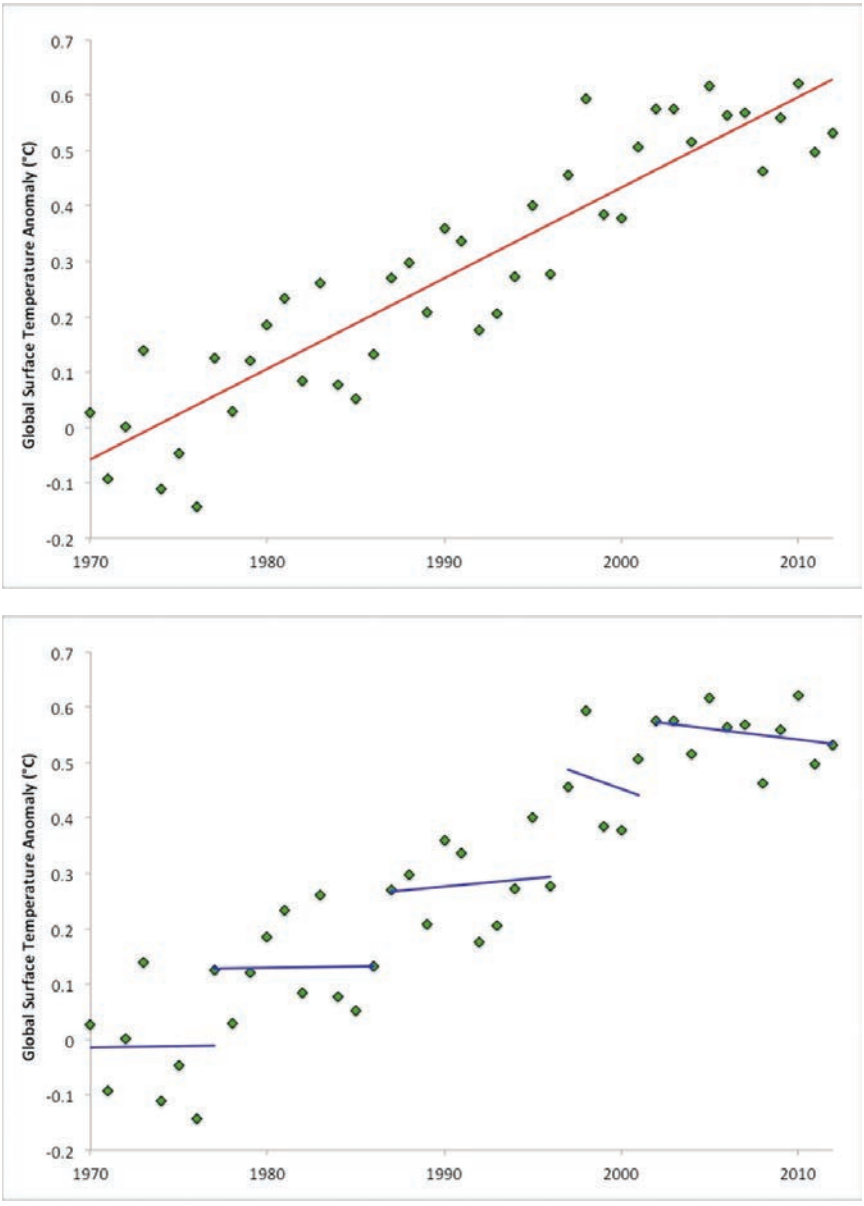
All this evidence demonstrates the recent acceleration of global warming. But what about the evidence from global surface temperatures?

The Temperature Plateau

The often-quoted global surface temperatures are a measurement of only a very small part of the global energy balance. However, they are important for two reasons. First, they are part of a continuous record of thermometer measurements that can be traced back a century and a half (and extended further into the past by geologists), unlike the measurements of deep ocean heat or polar ice loss, which are limited to the past few decades. Second, these measurements are easily appreciated by the public, relating to their sense of what warming means.

Surface temperatures fluctuate for many reasons other than greenhouse warming. For example, they are slightly affected by small variations in solar heating (the solar activity cycle). They are dominated on the short term by weather and by such multiyear cycles as the El Nino-Southern Oscillation (ENSO), which involves major redistribution of heat between the ocean and the atmosphere. The year 1998 saw one of the largest ENSO events in history, with resulting high measured temperatures. For all of these reasons, climate scientists looking for the effects of greenhouse warming prefer to average surface temperatures over timescales longer than a decade to help smooth out the "noise" caused by the solar cycle, ENSO, and other short-term changes due to volcanic eruptions.

Climate is not the same as weather, nor is it defined by this short-term in-



Two perspectives on the global average temperature changes since 1970. In the upper panel, the data are fit with a straight line. In the lower panel, they are fit with several straight-line segments, giving a "stair-step" fit. Both show the same temperature increase of 0.7 C over forty-two years, but we react differently depending on the way the data are presented. The plots show annual temperatures, relative to the average from 1964–1994. Data are averages from NASA (Goddard Institute for Space Studies), NOAA (National Climatic Data Center), and the UK Met Office (Hadley Centre). Figure compliments of Dana Nuccitelli (skepticalscience.com).

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terannual variability. Climate has long been considered to be a twenty- to thirty-year average. So whatever plateau may appear in annual temperature records, it is dominated by short-term fluctuations. There is no plateau in climatologically significant temperature. However, we are impatient and unwilling to wait twenty to thirty years to assess the reality of climate change. Looking at just the past decade of surface temperature measurements, there is an apparent plateau.

The denialists do not acknowledge the broad-based evidence of climate change, or the thousands of scientific papers published annually that strengthen our understanding of climate and have never been rebutted scientifically.

The two charts on p. 9 illustrate two different ways to look at the same information. Both plot the measured global temperatures from 1970 to 2012. The first fits a straight line in order to derive an average rate of heating over the past half century. The second fits the same data with a series of straight lines. The multiple straight-line fits show a temperature plateau from 2001 to 2012.

These charts illustrate two equally plausible ways to look at the data. One indicates a steady increase in temperature; the other shows a stair step or "escalator." Both show that the temperatures are rising, either continuously or episodically—take your choice. The temperatures in every decade over the past half-century have been higher than in the previous decade, and the two warmest years were both in the past decade, in 2005 and 2010.

Is the short-term temperature "plateau" significant? Perhaps, taken alone, it might be. But seen in the context of other evidence for a rapidly warming planet, this recent fluctuation in the surface temperature data is not evidence against global warming. Heat is being deposited on our planet, whether or not it yet shows up in short-term surface temperature data.

Conclusion

This short-term temperature plateau has become the primary argument of those who either question or outright deny the reality of human-caused global warming. Their argument is part of an overall denialist position that does not recognize the reality of climate science. Sometimes it is said that carbon dioxide is such a minor fraction of the atmosphere that it could not contribute to climate change, or even that it is absurd to imagine that anything humans do can have a major effect on our planet. This narrative asserts that climate scientists are simply seeing a correlation between temperatures and CO_2 concentration and claiming naively that this correlation implies causation. Therefore, if the temperatures do not rise steadily with CO_2, this disproves the entire idea of climate change.

The denialists do not acknowledge the broad-based evidence of climate change, or the thousands of scientific papers published annually that strengthen our understanding of climate and have never been rebutted scientifically. Their tactic is similar to that of the evolution deniers, who ignore entirely the research of evolutionary scientists and assert, simply, that biologists believe absolutely in the correctness of Darwin and have been naively interpreting all evidence according to a Darwinian dogma.

Those who deny climate science and evolutionary biology set up a strawman caricature of science and often succeed because so few people understand how science really operates. ■

For Further Reading

NASA Goddard Institute for Space Studies (http://data.giss.nasa.gov/)

National Center for Science Education (http://ncse.com/climate)

NOAA: National Climatic Data Center (http://www.ncdc.noaa.gov/cmb-faq/anomalies.php)

Skeptical Science: Climate Change Myths (http://www.skepticalscience.com/fixednum.php)

Skeptical Science: Getting Skeptical about Global Warming Skepticism (http://www.skepticalscience.com/)

University Corporation for Atmospheric Research (https://www2.ucar.edu/news/backgrounders/understanding-climate-change-global-warming)

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Bigfoot Lookalikes: Tracking Hairy Man-Beasts

Although Sasquatch—after 1958 generally called Bigfoot—is most associated with the Pacific Northwest (a region loosely ranging from northern California to Oregon, Washington, British Columbia, and southern Alaska), sightings are reported throughout the United States and Canada (Bord and Bord 2006). Many of these turn out to be hoaxes—notably Roger Patterson's filming of "Bigsuit" in 1967. (He used a gorilla suit purchased from costume-seller Phil Morris, converted it to Bigfoot by modifying the face and adding pendulous breasts, and enlisted a man named Bob Heironimus to wear the suit [Long 2004; Nickell 2011, 68–73].) Many other Bigfoot sightings are no doubt misperceptions resulting from expectation and excitement (Nickell 2011, 94–96).

But misperceptions of what? Over my years as a skeptical cryptozoologist, I have looked for real, natural lookalikes to explain various reported "monsters." For example, the round-faced, gliding, "Flatwoods Monster" of 1952 with its "terrible claws" seemed almost certainly to be a barn owl, just as "Mothman" of 1966, with its large, shining red eyes, could be identified as a barred owl (Nickell 2011, 159–66, 175–81). Again the legendary "giant eel" of Lake Crescent, Newfoundland, was probably inspired by otters swimming in a line (who are also known to be mistaken for some lake and sea monsters) (Nickell 2007; 2012a). Given these and other examples of monster lookalikes—I think of my work in this regard as that of a paranatural naturalist—we may ask: Are there animals that might be mistaken for Bigfoot?

A Candidate

As it happens, there is one especially good candidate for many sightings of Bigfoot—even for some of the non-hoaxed imprints of his big feet. The earliest record of potential Sasquatch footprints comes from an explorer named David Thompson, who while crossing the Rockies at what is today Jasper, Alberta, came upon a strange track in the snow. Measuring eight by fourteen inches, it had four toes with short claw marks, a deeply impressed ball of the foot, and an indistinct heel imprint (Green 1978, 35–37; Hunter with Dahinden 1993, 16–17).

The claws do not suggest the legendary man-beast. Indeed, John Napier, a primate expert at the Smithsonian Institution and author of *Bigfoot* (1973, 74), thought the print could well have been a bear's (whose small inner toe might not have left a mark). Thompson himself thought it likely "the track of a large old grizzled bear" (quoted in Hunter with Dahinden 1993, 17).

But what about sightings? It is not uncommon for eyewitnesses to state that at first impression their Bigfoot looked like a bear, thus proving the similarity (see Figure 1). Yet many go on to rule out that identification, based on some aspect of appearance or behavior. However, as considerable evidence in fact shows, many Sasquatch/Bigfoot encounters may well have been of bears. Mistaken identifications could be due to poor viewing conditions, such as the creature being seen only briefly, or from a distance, in shadow or at nighttime, through foliage, or the like—especially while the observer is, naturally, excited. Non-expert observation is also problematic, as is expectancy, the tendency of people who are expecting to see a certain thing to be misled by something resembling it (Nickell 2012b, 347).

Comparisons

A published compilation of 1,002 American and Canadian Sasquatch/Bigfoot reports from 1818 to November 1980 is instructive (Bord and Bord 2006, 215–310). Analysis of the cases (which are presented as brief abstracts) reveals that not only general anatomy but also color variations, footprints, behavior, and geographical distribution of Sasquatch/Bigfoot are often quite similar to those of bears.

Anatomy. Bigfoot is typically described as a large, hairy man-beast. It is said to walk on two legs, to have long arms, large shoulders, and, often, no neck. Although it is frequently likened to an ape, it has been reported many times to have claws (Bord and Bord 2006, 215–310; Wright 1962).

Like Bigfoot, bears can appear as large, big-shouldered, hairy, manlike beasts. Their anatomy is consistent

with bipedal standing (hence the long "arms") though much less so with walking—and, according to the Smithsonian expert John Napier (1973, 62), "At a distance a bear might be mistaken for a man when standing still. . . ." Consider this incident of a creature on the porch of a ranch house in western Washington State in 1933 (related at second hand, years later, by the daughter of the woman who observed it):

> It was moonlight outside, and at first she thought it was a bear on the porch, but this animal was standing on its back legs and was so large it was bending over to look in the window. She said it appeared over 6 feet tall and it didn't look like a bear at all in the moonlight. She said in a few minutes it walked over [no doubt only a couple of steps] and jumped off the porch and started around the house. She went into the kitchen so she could get a good look and she said it looked just like an ape. (Lund 1969)

Ape, Bigfoot, bear? You decide, but remember, this was bear territory. And a standing black bear can be up to seven feet tall (Yosemite 2013).

During several days in April 2013 in New York State's massive Adirondack Park, where there are scattered Bigfoot encounters, I talked to hunters and others who had witnessed standing bears. One man, at whose remote home I boarded for an evening, told me of once standing face to face with a black bear: it was on its hind legs looking in the window at him!

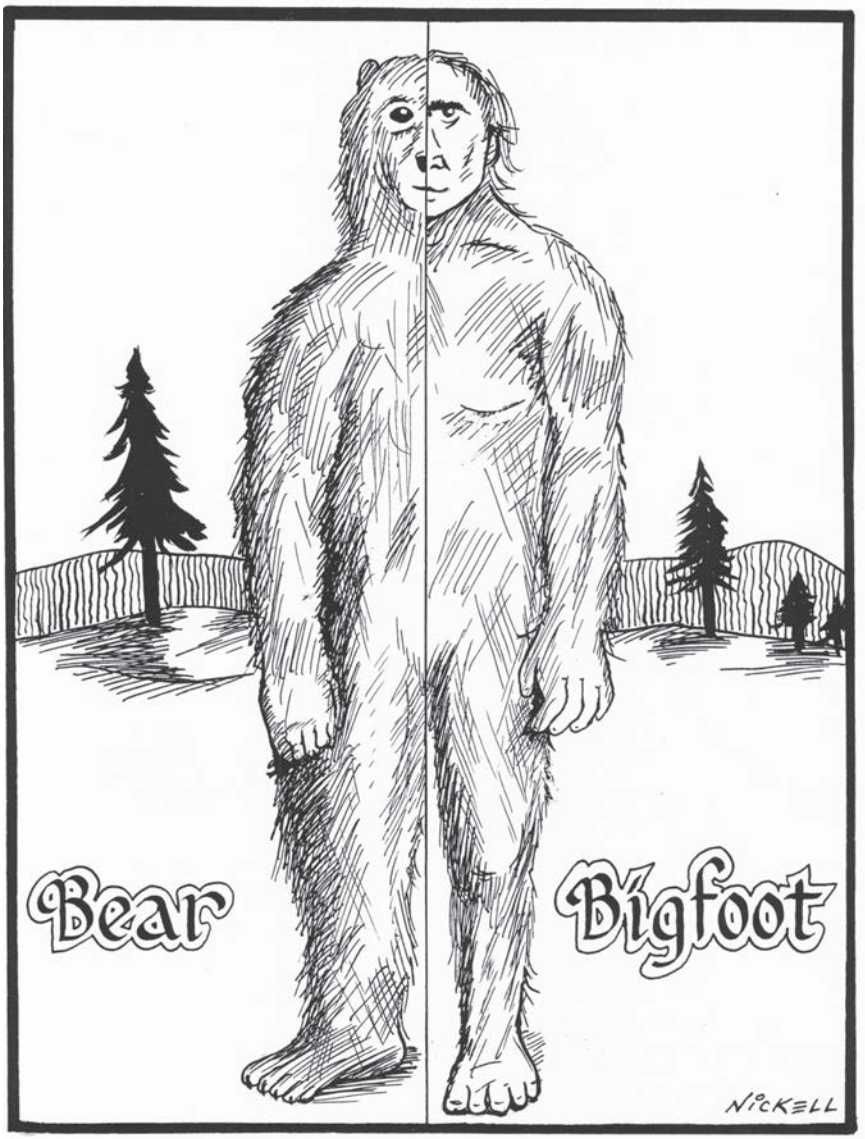

Figure 1. Split-image illustration compares a standing bear (left) to the creature it is often mistaken for, Sasquatch/Bigfoot (right). Drawing by Joe Nickell.

The often-reported action of Bigfoot running on all fours is entirely consistent with a bear, as in a case of late April 1897. Near Sailor, Indiana, two farmers witnessed a man-sized beast covered with hair walking on its hind legs, but it "afterwards dropped on its hands and disappeared with rabbit-like bounds" (Bord and Bord 2006, 23, 221). No doubt the "hands" were really paws. Again, in 1970, a Manitoba man saw a seven-foot, dark Bigfoot "stand up" by the roadside at night. And in 1972, at an Iowa state park, a seven-foot brown Bigfoot was shot at and "ran away on all fours" (Bord and Bord 2006, 260, 264; see also Green 1978, 246, 178).

One Bigfoot report was inspired when, in April 1978, a Maryland farmer saw a "bear" walking upright across a field, followed by two "smaller creatures on all fours" (Bord and Bord 2006, 300). This is consistent with a mother bear in alert mode with cubs. Bears often stand on their hind legs to look and to sniff the air, and black bears usually have a litter of two, born in January or early February ("Black Bears" 2013; Whitaker 1996, 703). And so, apparently, a *stated* bear encounter was converted by enthusiasts into a sighting of "Bigfoot." Some months earlier, in the fall of 1977, two South Dakota boys (ages twelve and nine) saw only "long hairy legs" in the bushes (Bord and Bord 2006, 294), and that likely bear became another "Bigfoot." Reports of Bigfoot's gait as "peculiar" or the like (Bord and Bord 2006, 290, 291) could be consistent with the awkward gait of an upright bear.

Coloration. Like descriptions of Sasquatch/Bigfoot, black bears can not only be black but also dark brown, brown, cinnamon, blond, off-white, and white (Herrero 2002, 131–34). The same is true of grizzly (brown)

bears (*Ursus arctos*), which—just like a Bigfoot reported in northern California (Bord and Bord 2006, 246)—often has dark-brown, silver-tipped hair (Herrero 2002, 133; Whitaker 1996, 706).

"To confuse the novice further," states a noted authority, "there are also variations in color patterning on the coats of each species." This is due to genetic factors and to molting. With most bears, a lightening in the color of the coat occurs between molts (Herrero 2002, 133, 134).

In nighttime sightings, color may go unreported, but the animal's eyeshine is frequently described. There are numerous reports of "gleaming eyes," "large glowing eyes," "green shining eyes," "glowing amber eyes," and the like, including occasionally "red eyes" (Bord and Bord 2006, 259–300). Generally, bear eyeshine is reported as ranging "from yellow to yellowish orange, though some people report seeing red or green" ("Backpacker" 2013). The North American Bear Center mentions a black bear with mismatched eyes, due to an injured eye that "shines red rather than yellow" ("Mating" 2013).

Footprints. Bigfoot has been reported to leave tracks that had two to six toes and ranged in length up to twenty or more inches (Bord and Bord 2006, 215–310). Of course, many large tracks—like the fourteen-inch ones of Patterson's "Bigsuit" creature—are hoaxed (Nickell 2011, 66–75; Daegling 2004, 157–87).

As to bears, Napier (1973, 150–51) observes that "The hindfoot of the bear is remarkably human-like," and that near the end of summer when worn down, the claws "may not show up at all" in tracks. Also at moderate speeds the hindfoot and forefoot prints may superimpose to "give the appearance of a single track made by a bipedal creature" (Napier 1973, 151).

Bears' five-toed hindprints range from about seven to nine inches long for the black bear to approximately ten to twelve for the grizzly (brown) bear, although some can be more than sixteen inches, and "In soft mud, tracks may be larger" (Whitaker 1996, 704, 707). As bear expert Herrero cautions: "I don't give measurements because track size varies so much depending on substratum. If a track seems very large, look at other track characteristics."

A bear's smallest toe (the innermost one, as opposed to that of humans) "may fail to register" (Whitaker 1996, 704), no doubt explaining many four-toed "Bigfoot" tracks. As well, "In mud a black bear's toe separation may not show" (Herrero 2002, 178), possibly giving rise to the illusion that—depending on just where there might be a slight separation—a "four"-toed track might appear to have been made with only two very broad toes, or even perhaps three. Rare, six-toed tracks (unlikely for either Bigfoot or bear) were found in Iowa in 1980 after a witness saw a "strange creature on all fours eating [a] carcass" (Bord and Bord 2006, 307). Except for the tracks (which were probably due to some anomaly like the overlapping of hind and fore feet), the creature is consistent with a bear.

None of the tracks mentioned in the 1,002 abstracts under study, representing reports from 1818–1980 (Bord and Bord 2006, 215–310), were reported to have dermal ridges (the friction ridges of, for instance, fingerprints). These are common to both apes and man, as well as, presumably, to an ape-man. (Although in 1982, a U.S. Forest Service patrolman discovered such prints in Oregon's Blue Mountains, in the Mill Creek Watershed, noted Bigfoot skeptic Michael Dennett [1989] turned up evidence that those tracks were part of an elaborate hoax.)

Behavior. Bigfoot's reported actions are quite varied. Aside from such outlandish reports as of a Sasquatch treating an Indian for snakebite or kidnapping people, numerous acts attributed to the fabled creature again have a ready explanation: bears. For example, Bigfoot often eats berries, fruit, grubs, vegetation such as corn, fish, animal carcasses, and human rubbish. It may be seen day or night. It often visits campsites, like one raided by a "cinnamon-colored Bigfoot" in Idaho in the summer of 1968 that left tooth marks on food containers. It also peers into homes and vehicles, and sometimes shows aggression (Bord and Bord 2006, 215–310; Merrick 1933).

Similarly, bears share these and other aspects of behavior with Bigfoot. For example, bears feed on most nonpoisonous types of berries (which they eat by moving their mouths along branches). As well, they tear open rotten logs for grubs, and they feed on fruit, corn, and other vegetation, fish, live or dead mammals, and human rubbish (Herrero 2002, 183, 149–71, 47; Whitaker 1996, 708). Bears likewise are encountered both day and night

Aside from such outlandish reports as of a Sasquatch treating an Indian for snakebite or kidnapping people, numerous acts attributed to the fabled creature again have a ready explanation: bears.

(Herrero 2002, 170; Whitaker 1996, 703–709). They visit homes, vehicles, and campsites looking for food, and they sometimes show aggression (Herrero 2002, 83–87; Whitaker 1996, 703–709). These and other parallels with Bigfoot are striking.

Then there are Bigfoot's vocalizations—many of which could well be those of bears. For example, Bigfoot often growls (Bord and Bord 2006, 237, 256, 268). One "snarled and hissed" at witnesses (268), and another "chattered its teeth" (255), while others "screamed" when shot at (247, 252). Similarly, bears growl and snort, and they make loud huffing or puffing noises (Herrero 2002, 15, 16, 115). Their most common defensive display is "blowing with clacking teeth"; as well, they may bawl (from pain), moan (in fear), bellow (in combat), and make a deep-throated, pulsing noise (when seriously threatened). Cubs "readily scream in distress" (Rogers 1992, 3–4).

Distribution. The habitat of Bigfoot in the 1,002 abstracts we are studying—from 1818 to November 1980—is extensive. It includes most continental American states (excepting Delaware, Rhode Island, and South Carolina) and eight of thirteen Canadian provinces. The greatest number of sightings were in Washington State (110), followed by California (104), British Columbia (90), and Oregon (77)—that is, in the Pacific Northwest, the traditional domain of Sasquatch—followed by Pennsylvania and Florida (42 each). It is reportedly seen in woods and fields, along streams, and so on (Bord and Bord 2006, 215–310; Nickell 2011, 225–29).

The distribution of black bears is strikingly similar, as shown by population maps provided by the Audubon Society (Whitaker 1996, 704) and elsewhere (Herrero 2002, 80). America's grizzly population was once quite extensive and included the western states (Herrero 2002, 4); however, grizzlies are now relegated mostly to Yellowstone Park (chiefly in northwest Wyoming) and its vicinity, and to portions of the northernmost areas of Washington, Idaho, and Montana, as well as most of British Columbia, Northwest Territories, the Yukon Territory, and Alaska (Herrero 2002, 4; Whitaker 1996, 708). Like Bigfoot, bears are also seen in woods and fields, along streams, and so on.

Assessment

Again and again come eyewitness reports of Bigfoot that sound like misreports of bears. In Washington State, for instance, in 1948, a man saw a "thin, black-haired, 6-ft Bigfoot squatting on [a] lake shore." In September 1964 a Pennsylvania man spotted "Bigfoot peering in a window of his mother's home at dusk," while a man sleeping in his car in northwest California was "woken by Bigfoot shaking it." In July 1966, a British Columbia woman saw "head and shoulders of Bigfoot above 6-ft raspberry bushes at night." In June 1976, three Floridians saw a creature "6 ft tall, with long black hair, standing in a clump of pine trees." In August 1980, two Pennsylvania men "Driving down a mountain, saw husky black hairy creature standing in road." And so on, and on (Bord and Bord 2006, 230, 241, 244, 287, 309).

Let it be understood that I am in no way saying that all Sasquatch/Bigfoot sightings involve bears. After all, some are surely other misidentifications or hoaxes involving people in furry suits (Nickell 2011, 72–73). As well, Venezuela's "Loy's Ape" of the 1920s was identified as a large spider monkey, and two specimens of China's legendary Yeren, shot in 1980, proved to be the endangered golden monkey (Nickell 2011, 85–87, 96).

I am merely pointing out, what should now be obvious, that many of the best non-hoax encounters can be explained as misperceptions of bears. Of creatures in North America, standing bears are the best lookalike for the bipedal, hairy man-beasts called Bigfoot. Bears also frequently behave like Bigfoot, and they are found in regions common to the legendary creature—no certain trace of which, in the fossil record or otherwise, has ever been discovered. ■

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[THINKING ABOUT SCIENCE MASSIMO PIGLIUCCI

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Truth, Part I

Try asking a scientist what the aim of science is, and somewhere in the explanation the word *truth* will likely appear prominently. If you probe a little further and ask said scientist how they would know that a given scientific statement or theory is true, they'll invoke one version or another of what in philosophy of science is known as the correspondence theory of truth (CToT). Indeed, I bet that a number of skeptics would respond the same way to those very same questions.

The CToT basically captures the common intuition that when one says "X is true," what one means is that there is a correspondence between statement X and a state of affairs in the world described by X. Aristotle was one of the first to articulate the CToT, in his *Metaphysics*: "To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, and of what is not that it is not, is true." Okay, not the most elegant rendition, but it basically boils down to this: when I say that I think the Copernican-Keplerian theory of the solar system is true, I mean that the Sun *really* does occupy one of the foci of the elliptical trajectories that describe every planet's orbit.

There are at least a couple of problems with the CToT. To begin with, it is surprisingly difficult to be precise about what type of relation this "correspondence" actually is; moreover, and perhaps more surprisingly, it isn't even clear what we exactly mean by "truth."

Let's start with the second problem. Presumably we all agree that the above-mentioned Copernican-Keplerian theory is true. We also presumably agree that, say, Pythagoras's theorem is true (yes, yes, within the framework of Euclidean geometry). If you accept standard (Aristotelian) logic, you will also agree that the law of the excluded middle is true (it says that either a given proposition is true or its negation is, but not both). Now, how about that it is true that murder is immoral? Well, that might depend on your ethical stance, on what one means by "murder," and on whether you are a psychopath.

The point is, statements about the physical world may be true or false in a different sense from which mathematical, logical, or moral statements are true or false (and the latter three also differ among themselves, obviously). So "truth" turns out to be a heterogeneous concept, and we better make clear in which of the above (or possible other) senses we are using it.

Statements about the physical world may be true or false in a different sense from which mathematical, logical, or moral statements are true or false (and the latter three also differ among themselves, obviously). So "truth" turns out to be a heterogeneous concept, and we better make clear in which of the above (or possible other) senses we are using it.

Once this initial hurdle is clarified we can then turn our attention to the other problem: if the CToT is a "theory," we better have a handy explanation of how it is supposed to work. Surprisingly, most philosophers since Aristotle have simply *assumed* that the CToT is, well, true, considering it too self-evident for further elaboration. (Scientists usually don't even pose themselves the question, of course. For them the CToT is the only tool in the box, and they are simply concerned with using it properly.)

Things got more complicated during the second part of the twentieth century, when a number of philosophers began to point out the problems with the CToT, as well as to produce some possible alternative theories of truth. The most obvious problem is epistemic: if we judge a scientific theory to be true *because* it corresponds to the way the world actually is, how do we *know* the latter, since we only have access to the world through theorizing and theory-dependent observations and experiments? Another way to look at the problem is to say that the CToT seems to assume the availability of a god's eye view of things (or, as philosophers put it more often these days, a "view from nowhere"). But human beings are bound by particular perspectives on the world; we don't have independent access to the world as it actually is—as Immanuel Kant famously pointed out

back in the eighteenth century.

Karl Popper thought of getting around this problem by claiming that we can never know whether a scientific theory is true, but we can know whether it is false (if it is contradicted by suitable observations or experiments). Popper proposed that the more a scientific theory survives attempts at *falsification* the more we can say that it is truth-like: the more it withstands falsification the more its degree of verisimilitude increases. That being the case, then, scientific progress itself can be reconceived not as a grand march toward truth, but more modestly—but equally effectively—as a continuous increase in verisimilitude.

This, unfortunately, doesn't work. For one thing, falsificationism itself is not a tenable account of scientific progress. Historians of science have conclusively shown that scientists don't actually discard theories when they are falsified, and often for good reasons. A good example is the Copernican part of the Copernican-Keplerian theory: Copernicus got the position of the Sun (roughly) correct, but the observations of planets' positions didn't square with the theory because he assumed the planetary orbits were circles. The realization that they were actually ellipses was Kepler's brilliant insight. Moreover, turns out that philosophers of science have shown that not being wrong (i.e., not having been falsified yet) does not guarantee a monotonic approach to the truth, so that we cannot actually measure the degree of verisimilitude of any given theory at any given time (unless we have access to the view from nowhere, but then we are back to square one).

Stay tuned! Next time: some alternatives to the correspondence theory of truth. . . . ■

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The Mysteries of Leonardo

Leonardo da Vinci not only epitomizes genius and creativity, but he is also one of the most sought-after sources of mysteries, both real and invented. Probably the most famous example of this is *The Da Vinci Code*'s many legends linked to this inventor, but there are many other examples, as we shall see.

Leonardo the Heretic

According to some authors of historical fiction, Leonardo was a heretic. Evidence of this is supposedly hidden in his painting *The Last Supper*, where it is said that the Master himself expressed his belief that Christ was married to Mary Magdalene. The woman is to be identified with the Apostle showing feminine traits and sitting to the right of Jesus. Further evidence in support of the genius's heresy would be the lack of the chalice with the wine on the table, symbol of the Eucharist, and the presence of a disembodied hand holding a menacing knife.

What are the facts? In reality, for *The Last Supper*, the magnificent mural painting adorning the refectory of the Convent of Santa Maria delle Grazie, in Milano, Italy, Leonardo took his inspiration from the Gospel of John, where there is no mention either of the chalice with the wine or of the Eucharist. In addition, the hand with the knife belongs to Peter (as demonstrated by the preparatory drawings by Leonardo preserved at the Windsor Royal Library) and refers to an episode in the Gospel, where Peter cuts the ear of the servant of the High Priest. Finally, the delicate appearance of John belongs to the iconography of the time, where the younger apostle, Jesus's *favorite*, was always represented as a teenager with long hair and gentle features.

Leonardo and his *Virgin of the Rocks* painting.

Esoteric Symbols Everywhere

Although maybe not a heretic, and certainly not a devout Catholic, it is possible that Leonardo may have been in contact with ideas that, at his time, were considered heretical, such as neo-Platonic and Gnostic ones. The latter, for example, included belief in *Sophia*, the mother goddess who created the world, which Leonardo might have wanted to represent with *Leda*, a lost painting. In some remaining copies of the painting, the great mother is seen as a "cosmic egg," from which other eggs give rise to humans. The Gnostics also believed that there were two forms of Jesus, one carnal, who died on the cross, and one that was only spirit. Another famous painting by Leonardo, the *Virgin of the Rocks*, shows two children similar to one another: perhaps the one commonly referred to as John the Baptist was actually Jesus's double and his identity was disguised in order to get it accepted by the religious clients. Unlikely, but no one can tell for sure today.

Another question then concerns Leonardo's propensity to often portray St. John the Baptist. Some people wondered if this attachment to the saint did not conceal something else, maybe the adherence to the cult of St. John, the same one held by the Knights of the Order of Malta. However, these are assumptions that art historians are still questioning.

Was Leonardo a Member of the Priory of Sion?

The entire *Da Vinci Code* by Dan Brown (note the absurdity of calling the Master not by his name, Leonardo, but by the name of the town where he was born, Vinci, apparently believing it to be his surname) revolves around

the mysterious and ancient sect of the "Priory of Sion," keeper of secrets and founded by the ever-present order of the Templars. It is said that among its members there were luminaries such as Isaac Newton, Victor Hugo, and of course Leonardo. In reality, the sect was invented out of whole cloth by Frenchman Pierre Plantard in 1956. Plantard took the name "Priory of Sion" from a hill above Annemasse, where he planned to install a retreat house. As for the list of the "initiated," Plantard copied it from the list of alleged "Imperators," that is, the supreme heads, of the Ancient and Mystical Order Rosae Crucis, founded in 1915 in the United States by another creator of fantasies, Harvey Spencer Lewis, with whom Plantard was in contact. Anti-Semitic, anti-Masonic, and a member of the French right, Plantard orchestrated this plot in order to create a historical line, likely to prove his own descent from the Merovingian as an heir to a dynasty lost in the mists of history, giving him wide room to maneuver and a huge advantage over many orders of competing Grand Masters and maybe leading him to a leading political role. It didn't work.

Leonardo Author of the Shroud of Turin?

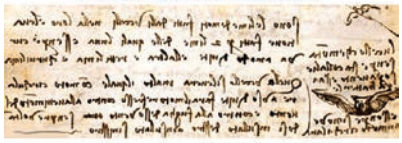
According to Lynn Picknett and Clive Prince, the Shroud of Turin was the work of Leonardo. Writer Victoria Hazel interprets a passage in the *Codex Atlanticus* as a "confession" on the part of its author: "When I painted Domene God an infant, you put me in prison: now, if I do him big, you will make me worse things." Not only that, according to Lillian Schwartz, the face of the Shroud fits with the self-portrait of Leonardo and would therefore be an experiment in pre-photographic techniques devised by the genius of Vinci.

In fact, the historical sources (the first written reference to the Shroud is a memorial in 1389), as well as the scientific radiocarbon dating, show that the Shroud was prepared in a period of time included between 1260 and 1390. It is therefore likely to be a work of art, but very unlikely that it was painted by Leonardo, since it was already around at least for a century before he was born.

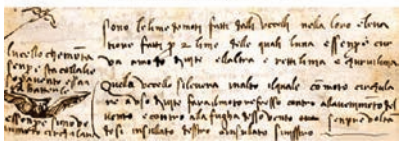
Mirror Writing

Leonardo possessed an unusual mirror writing technique; that is, he wrote going from right to left and often started to write on the last sheet, and then reached the first. This peculiarity has often been interpreted as an attempt put in place by Leonardo to keep his work secret and incomprehensible to most people. Those who considered him a heretic had even come to call it the "writings of the devil" because of this characteristic. In fact, it was his spontaneous way of writing. Neurologists have shown that his was a habit acquired in childhood, natural for lefties that were not corrected, as Leonardo was. He wrote also with "normal" calligraphy, but with less ease and especially in demonstrative occasions, such as for some topographic maps. Not surprisingly, Leonardo did dictate to others his letters of introduction.

Leonardo's backwards handwriting



Same handwriting in mirror



Who Is Actually the Mona Lisa?

The identity of the woman depicted in the most famous portrait in the world has long been debated. Some authors have suggested, citing evidence not always credible, that the woman was a Sforza, perhaps Catherine, or her mother, Caterina Buti del Vacca, or even her half-sister Bianca. In addition, there are those who think that the Mona Lisa is nothing less than a self-portrait of Leonardo, as shown by a superposition of the two faces to the computer. In fact, it is quite certain that the woman portrayed is Lisa Gherardini, that is, "Monna" (short for "Madonna" or as we would say today "Lady"). Lisa, wife of Francesco del Giocondo (hence "Gioconda," as the painting is also called). Rather more difficult to exactly establish, however, is the location in the background. The bridge on the right is reminiscent of one in Buriano, near Arezzo, but it is more likely that this is an idealized landscape dreamed up by Leonardo.

The Lost Remains of Leonardo

Finally, one last mystery: What happened to the remains of Leonardo? His tomb no longer exists and no one knows where his bones lie now. At his death he was buried in the Church of Saint-Florentin in Amboise, France. But in 1802, due to the erosion of time and revolutionary vandalism, the ruins of the chapel were destroyed, and the gravestones and tombstones were used to restore the castle. Children used to play with the abandoned bones, so a gardener picked them up and buried them. In 1863, the poet Arsène Houssaye discovered an intact skeleton, with a bent arm and a very broad skull. Not far from that spot he also unearthed fragments of a slab half deleted with the following readable letters: EO DUS VINC. It is perhaps Latin for Leonardus Vincius? These bones ended up in the castle of Amboise, where they still are and where it is stated that they "supposedly" belong to Leonardo.

But, like many other questions surrounding the incredible life of the Renaissance marvel, this one will probably remain forever unanswered as well. ■

[PSYCHIC VIBRATIONS ROBERT SHEAFFER

Sheaffer's "Psychic Vibrations" column has appeared in the Skeptical Inquirer for more than thirty years; its highlights have now been published as a book (Create Space 2011). Sheaffer blogs at www.BadUFOs.com, and his website is www.debunker.com.

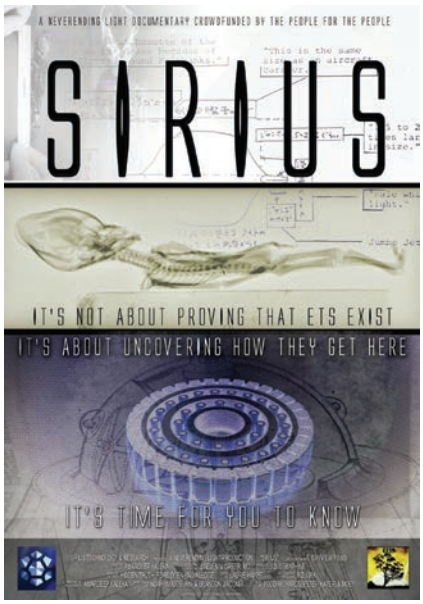
You Can't Possibly Be Sirius!

The official world premiere of the movie *Sirius*, directed by the Emmy-award winning Amardeep Kaleka and based upon the claims of UFO-celebrity Steven Greer of CSETI, took place in Hollywood on April 22. The movie's website summarized its message as follows:

> The Earth has been visited by advanced Inter-Stellar Civilizations that can travel through other dimensions faster than the speed of light. They use energy propulsion systems that can bring us to a new era. Humans have also developed these systems but those in power have suppressed them in order to keep us at the mercy of fossil fuels. . . . "This really is the greatest story never told" says Dr. Greer, "Once people understand that classified projects have figured out how UFO's operate, they will realize we no longer need oil, coal and nuclear power. This is the truth that has driven the secrecy."

Greer delivers a similar message in the highly controversial conspiracy-oriented movie *Thrive*, whose bizarre and conspiratorial political message has riled many on both the left and the right.

Funding for the movie was obtained through crowdsourcing. On July 28, 2012, Greer announced meeting his fundraising goal of $250,000. But he still needed more money because, you see, "There is a chance that we may be able to include in the film 'Sirius' the scientific testing of a possible Extraterrestrial Biological Entity (EBE) that has been recovered and is deceased. This EBE is in the possession of a cooperative institute desiring further scientific evaluation of the possible ET. We cannot reveal at this time the location of this being or the name of the person or persons who possess it." The additional funds were indeed duly raised.


A NEVERENDING LIGHT DOCUMENTARY CROWDFUNDED BY THE PEOPLE FOR THE PEOPLE
SIRIUS
IT'S NOT ABOUT PROVING THAT ETS EXIST
IT'S ABOUT UNCOVERING HOW THEY GET HERE
IT'S TIME FOR YOU TO KNOW

Steven Greer and promo for movie *Sirius*.

As *Sirius* opens, we see Greer going into a college auditorium in Santa Monica, the audience being checked with metal detectors for weapons. "Most people don't know what a Dead Man Trigger is. . . . Very few people need one." But Greer has one, and if the Conspiracy rubs him out, lots of sensitive documents get sent out to influential people. Of course, if Greer actually had any documents as hot as all that, he would have surely given them to the press long ago.

Most of what we see after that comes in no particular order. We are given UFO cases and UFO witnesses in a popcorn sort of manner: no sooner does one bounce up than it falls back and another takes its place. There is no time (or need) for exposition or analysis. Every case, and every claim, is apparently completely solid and needs no further explanation or proof. The "organization" of the film was such that one could have taken almost any segment of it, and switched it with any other, and the change would scarcely be noticed. Some things that we are shown, for the most part quite briefly, include:

- President Eisenhower's warning about the Military-Industrial Complex
- Dr. Oppenheimer saying, "We have done this (nukes) before"
- Ancient aliens
- Federal reserve and oil company conspiracies
- MJ-12 Government UFO cover-up conspiracy
- NASA Space Shuttle UFO video
- Many "free energy" claimants, including T. Townsend Brown, Tom Valone, Tom Bearden, Stanley Meyer, John Searl, Eugene Mallove, John Havrilla
- Anti-gravity and electrogravitics claims
- Automobiles that can run on water, covered up by "petro-fascists"

I was interested in the scene about

CSETI's CE5 training session, "human-initiated contact," which involves, among other things, meditation and remote viewing. They go into the desert or some other remote place, and shine a flashlight or laser at any light they see in the sky. If it appears to flicker back, it is seen as evidence of interstellar communication. Many of the ET craft are "trans-dimensional," and thus are not visible to the human eye. However, they can be seen using night-vision equipment, which apparently has the capability to make trans-dimensional things visible. I once spoke with a fellow at a UFO meeting who had been through Greer's "training," and he was very impressed by it. He explained that, at first, he could not see any of the ET craft that Greer was talking about. But as the training progressed, he learned how to perceive them.

"We have acquired an EBE!" boasts one of Greer's CSETI colleagues, and the analysis of this little guy—just six inches long—is the principal "news hook" for the film. We are told that this little body was dug up in the Atacama Desert in Chile, and ended up in Barcelona, Spain. 3D scans reveal its internal organs, apparently very human-like. Now here is the biggest "bombshell" of the film: DNA from this creature has been analyzed by Dr. Garry P. Nolan of the Stanford University Medical School. The results:

> . . . the 6 inch specimen is a human that was likely 6-8 years of age at the time of death (age based on epiphyseal plate X-Ray density standards). X-Ray imaging and CT scan results confirmed the specimen is biological and is not a non-human primate. The specimen was concluded by the medical specialist to be a human child with an apparently severe form of dwarfism and other anomalies… Reconstruction of the mitochondrial DNA sequence and analysis shows an allele frequency consistent with a B2 haplotype group found on the west coast of South America, supporting the claimed origination of the specimen from the Atacama Desert region of Chile. Sequence analysis definitively rules out the specimen as an example of a New World primate.

So, supposedly the little critter is a human child, at least six years old, and only six inches long. This sounds almost as implausible as an ET!

So, supposedly the little critter is a human child, at least six years old, and only six inches long. This sounds almost as implausible as an ET! Some proposed explanations include a deformed fetus, or a parasitic twin that had been growing inside some person's body.

Barely had the buzz over *Sirius* begun to fade when the next UFO circus began, organized by Stephen Bassett of Paradigm Research:

> An event with historical implications will be held at the National Press Club in Washington, DC from April 29 to May 3, 2013. At that time as many as forty researchers and military/agency witnesses will testify for thirty hours over five days before former members of the United States Congress. . . . The Citizen Hearing on Disclosure of an extraterrestrial presence engaging the human race will attempt to accomplish what the Congress has failed to do for forty-five years—seek out the facts surrounding the most important issue of this or any other time. (http://www.citizenhearing.org)

This event was far from "historical," as there have been at least six other "UFO disclosure" events held at the National Press Club, beginning with Steven Greer's *Disclosure Project* on May 9, 2001. Of course, to lobby for "disclosure" implies that there is something to "disclose," which is highly dubious. And to hold a valid "hearing" implies that witnesses are queried under oath, which of course will not be the case, leaving them free to fabricate as much as they please without fear of repercussions. The five former members of Congress are being paid a reported $20,000 each to participate in this circus. As noted by the website www.ParaPolitical.com, the "Citizens Hearing" featured the

> hands-down, nuttiest U.S. congressmen who ever lived. . . . The hearing panel will be headlined by former congressman Merrill Cook (R–Utah) who was once banned from his own party's offices after a profanity-laced tirade and was famously plagued during his few years in Congress by reports of erratic behavior leveled by his own staff. . . . Cook's chief of staff Janet Jenson wrote in an intra-office e-mail in 2000. "If he asks you to fax his underwear to the speaker's office, please just do it."
>
> Joining Cook will be former congressman Roscoe Bartlett (R–Maryland). The eighty-six year-old raised eyebrows in 2004 when he attended a Unification Church event to receive the "Ambassador of Peace medal" from cult leader Sun Myung Moon who, afterwards, declared himself the Messiah and his wife the Assistant Messiah as Bartlett watched in delight... Also appearing is former congresswoman Cheeks Kilpatrick (D–Michigan) who embarrassingly failed to receive her own party's re-nomination in 2010. . . .
>
> Rounding out this happy band… is former senator Mike Gravel (D–Alaska). Since his most recent bankruptcy, Gravel has pathetically taken to making public appearances for anyone who will buy him lunch—his previous engagements have included a conference sponsored by the holocaust denial website *Barnes Review*. (UFO conspiracies aren't Gravel's only angle. He's also been working the 9/11 Truth circuit and several truther websites have accused him of absconding with donor funds.) (http://tinyurl.com/kq5ltxr)

As for the so-called "witnesses," it was mostly the usual suspects: Stanton

Friedman, Steven Greer, Nick Pope, Roger Leir, etc. Lee Speigel wrote a good summary of the "hearings" in a series of articles for the *Huffington Post* (http://www.huffingtonpost.com/lee-speigel/). Here are a few brief excerpts:

- "Linda Moulton Howe on reported UFO abductions and the possible manipulation of the human mind. She tells a story about a military person who told her he was on a team that, in 1978, was assigned to investigate a town that was allegedly flooded by extraterrestrials."
- "Kilpatrick introduces Nation of Islam leader Louis Farrakhan." [Farrakhan claims to be a UFO contactee.]

"Sgt. James Penniston claims a Close Encounter With A UFO Taking Off" (Rendlesham Forest, U.K, 1980). [Apparently nobody asked him about that "binary message" that he supposedly received "telepathically" from the UFO, and wrote down—thirty years afterward.]

- Dr. Robert Wood [the principal promoter of recent MJ-12 documents, supposedly revealing a secret government UFO cover-up group] said, "The identification of one aspect of a questioned document as being anomalous often results in a skeptic accepting none of the rest of the document, even though it might be filled with accurate information. It seems to be accepted in the intelligence community that faked documents usually—if not often—contain much valid information to help get it accepted as genuine throughout." [In other words, the MJ-12 documents are accurate despite the fact that they're fake.]
- Lt. Col. Richard French (Ret.) told the committee about an incident he witnessed in the late 1960s in Alamogordo, New Mexico: "I learned of an accident a few miles away in the direction of White Sands [missile range] . . . Afterward [I was told] there was an unknown number of humanoids, either killed or injured. The parts of the casualties were taken to base operations at Holloman Air Force Base [in New Mexico]." [French claims to have been an investigator for Project Blue Book, sent to various destinations to debunk sightings and say it was all swamp gas. However, there is absolutely no proof that French ever had any connection with Blue Book. None of his claims about UFOs can be substantiated in any way, and they appear to be fabrications.]
- "A 15-minute video was about to be shown of a 77-year-old man, in very bad health, who wanted to take the opportunity to reveal a story of what happened to him while he worked for the CIA under Pres. Dwight Eisenhower in 1958. This gentleman has received numerous threats from his government not to talk. . . . X goes on to talk about how Eisenhower was upset when he learned that there was activity going on at a base in Nevada (that would later be renamed as Area 51) that the government allegedly had no jurisdiction over. Eisenhower sent X and his boss to the base to find out what was going on there. "There were different garage door openings and inside they had different saucer crafts. The first one was the Roswell craft—it was kind of crashed up, but apparently every alien had died except for a couple. Later on we viewed the autopsy film and then the colonel said, 'What we've got in here is we're interviewing a grey alien.'"

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How successful were the so-called "hearings"? According to a post-mortem analysis by Parapolitical,

> Google Trends actually recorded a decrease in online interest in the term "UFO" during the carnival. To say this week's UFO carnival—billed as a "mock congressional hearing"—at the National Press Club was a failure would be an understatement. . . . There are roughly 2,200 television stations in the U.S. Three covered the event. Radio coverage was similarly sparse.

Now Bassett says that he wants to take his UFO show to the UN. But according to exopolitic's Alfred Lambremont Webre, a former colleague of Basset, "UFO Citizen Hearing witnesses Bassett, Huneeus and Greer's anomalous eye and body part movements may indicate brain-mind entrainment by manipulatory extraterrestrials or advanced military-intelligence nanotechnology as part of a global control agenda" (http://tinyurl.com/moejb7v). ■

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Obesity Redux: A Response to Readers

In thoughtful response to my recent SI column, "Obesity: What Does the Science Really Say?" (May/June 2013) a number of readers wrote to me or the editor raising crucial issues deserving of an equally considerate response. As such, and because a great deal of new science has been published on the subject, I've chosen to forego the Letters section and address these readers' concerns here.

One foundational question tends to resurface every few years or so. It asks whether excess adiposity is in fact a serious health problem, as prevailing medical opinion has dictated for more than half a century, or whether it is just as well or even better to be fat.

A new *Journal of the American Medical Association* study on the topic (Flegal et al. 2013) caused quite a stir this year among both the popular media and public health officials. Four American and Canadian researchers led by Katherine Flegal of the National Center for Health Statistics, Centers for Disease Control and Prevention, Hyattsville, Maryland, reviewed ninety-seven studies providing a sample size of more than 2.88 million individuals and 270,000 deaths to calculate all-cause mortality hazard ratios for standard body mass index (BMI) classifications.[1]

Flegal's results caused some lay observers to inquire, as *Slate* magazine's William Saletan did on January 2, "Is Fat Good?" Her team reported as follows: Relative to normal weight, all combined grades of obesity were associated with an 18 percent higher incidence of all-cause mortality. In cases of more extreme obesity, the association rose to 29 percent. By itself, however, the mildest grade of obesity was not correlated with a significantly elevated risk, and the overweight but not obese category was actually associated with a 6 percent *lower* incidence of all-cause mortality.

Interesting data, to say the least. But how should they be responsibly interpreted? Unsurprisingly, much of the popular media, along with certain food and drink special interests, focused on one possible explanation they assumed their audiences and customers would prefer to hear—essentially that being overweight as a general proposition can be a positive thing.

On the other hand, certain popular sources failed to report Flegal's own list of potential explanations, including an "earlier presentation of heavier patients" and a "greater likelihood of receiving optimal medical treatment." In such instances, those inclined for whatever reason to favor a positive appraisal of excess adiposity should be prepared and willing as well to endorse an increased need for frequent medical attention.

But the so-called "obesity paradox" is nothing new. Since the 1980s, it has typically proposed that, although being overweight raises a person's risk of diabetes, heart disease, cancer, and many other chronic illnesses, some people—particularly the ill and those of middle-age or older—might actually benefit from a little, though never a lot, of extra weight (Hughes 2013).

One foundational question tends to resurface every few years or so. It asks whether excess adiposity is in fact a serious health problem, as prevailing medical opinion has dictated for more than half a century, or whether it is just as well or even better to be fat.

Indeed, in an editorial to Flegal's study, two physicians suggested that slightly elevated BMIs in patients suffering from certain chronic diseases, acute catabolic illnesses, and even traumatic injuries might be sensibly associated with lower mortality (Heymsfield and Cefalu 2013). If so, it becomes apparent why overweight or even mild obesity could both increase the risk of life-threatening diseases and decrease mortality rates.

But no responsible health care pro-

fessional endorses excess weight gain generally. In fact, at least one recent study has linked higher BMIs to not only the aforementioned physical ailments but to impaired cognition and poorer memory in postmenopausal women as well (Kerwin et al. 2010). In addition, other experts continue to warn, for example, that "individuals exposed to maternal obesity during fetal life are at increased risk of becoming overweight or obese children and adults themselves, thus perpetuating the vicious cycle of obesity" (Gillman and Poston 2012).

We should of course remain open to all potential subtleties regarding adiposity and health. But given the depth and breadth of the evidence associating extreme overweight with all manner of affliction, the primary public-health objective must be to prevent both obesity and pre-obesity.[2]

Other readers have questioned or commented on the efficacy of certain popular diets. It should be acknowledged from the start, of course, that good health is primary and that only diet plans holding nutrition above or alongside weight-loss or weight-maintenance are worth consideration. In fact, both my research and personal experience lead me to believe that the only truly effective weight-loss diets are also exceptionally healthy ones.

Experts have now established that the typical Western diet—one replete with fried and sweet foods, processed and red meats, refined grains, and high-fat dairy products—is less than ideal, to put it most diplomatically. A recent British study, for instance, followed 3,775 men and 1,575 women of middle-age for an average of sixteen years and concluded quite sweepingly that adherence to Western-style cuisine significantly reduces the prospect of "ideal aging," i.e., remaining free of chronic diseases and retaining high physical, mental, and cognitive functionality (Akbaraly et al. 2013).

That much resolved, the implied query remains: With what should we replace the typical Western diet? I recommend that we begin by conceiving of a "normal" diet. In other words, why not define appropriate nutritional habits (yes, plural) scientifically as ones offering foods and portions that the human species, or perhaps slightly more specific human populations, evolved to consume? From there, individuals can and must fashion more exclusive diet plans that suit their particular objectives and biological circumstances.

The public fixation with the 'Paleo' diet ignores the heterogeneous nature of our ancestors' environments and assumes an ideal past that never existed.

As one reader observed, some inclined toward an evolutionary definition have endorsed the "Paleo" diet, based on the assumed consumption habits of our ancestors who lived from 2.5 million to 10,000 years ago. Thus, all foods invented during or after the agricultural revolution are unceremoniously expunged from the menu. On the obviously positive side, Paleo dieters exclude all processed sugars, meats, and grains. More controversially, however, they eliminate dairy, peanuts, lentils, beans, and peas, for example.

Like many of her colleagues, biologist Marlene Zuk has judged the Paleo diet's logic a fundamentally flawed fantasy (Zuk 2013). First, says Zuk, we shouldn't even hope to construct a nutritional plan based on the distant past when so much has changed in recent millennia, including the biology of every species of plant, animal, and human on the planet.

Second, Paleo diet dogma denies its followers the benefits of some exceptionally nutritious fare. Dairy is rich in calcium, for example; whole grains are packed with fiber and vitamins; and legumes are replete with protein. Consider the various circumstances of consumption as well. Why, for instance, should athletes rebuff easily digested sources of carbohydrates that help them recover quickly and safely from especially vigorous exercise?

Finally, the Paleo fixation ignores the heterogeneous nature of our ancestors' environments and assumes an ideal past that never existed. The truth is we don't know exactly how much meat, fish, fruit, or even primitive grains our Pleistocene forebears ate, or at what precise stages of their evolution. What we do know is that, to survive, they had to be flexible—not doctrinal.

Another reader contemplates the Mediterranean diet, also the subject of recent popular headlines. One especially noteworthy study, published last February in the *New England Journal of Medicine*, contrasted the cardiovascular health benefits of one low-fat diet with those of two Mediterranean-style diets—one supplemented with nuts, the other with extra-virgin olive oil (Estruch et al. 2013). After following 7,447 randomly assigned Spaniards at risk for heart disease, the investigators found that, relative to a low-fat plan, adherence to either Mediterranean plan reduced a patient's risk of suffering cardiovascular death, myocardial infarction, or stroke by thirty percent.

So exactly what did the Mediterranean dieters eat? In addition to either nuts or olive oil, participants consumed at least three daily servings of fruit and at least two servings of vegetables. Fish was eaten at least three times per week, as were legumes. The menu offered white, but not red, meats and permitted the drinking of wine. On the other hand, subjects avoided cookies, cakes,

and pastries completely and limited their consumption of dairy and processed meats.

Perhaps most notably and controversially, however, the authors' data tend to refute the long-standing conviction that fat intake must be reduced to promote cardiovascular health. So what of vegetarianism, one might reasonably wonder—is its well-documented reputation for good health at least somewhat overblown?

Not according to a group of researchers from Loma Linda University who recently studied 73,308 male and female Seventh-day Adventists (Orlich et al. 2013). Participants were categorized as nonvegetarians, semi-vegetarians, pesco-vegetarians (accepting seafood), lacto-ovo-vegetarians (accepting dairy and eggs), or vegans (excluding all animal products). After an average of six years per subject, 2,570 deaths were recorded.

Overall, the group calculated a twelve percent lower adjusted hazard ratio for all-cause mortality in the combined vegetarian versus nonvegetarian categories. Oddly, the association was far stronger for men (vegan males scored a 28 percent lower hazard ratio than nonvegetarians) and less than statistically significant for women.

When considered in light of the "hormonal/regulatory defect" hypothesis proffered by writers like Gary Taubes and Robert Lustig, recent studies and commentaries offer considerable, though certainly qualified and incomplete, guidance for the obese and severely overweight.

First, though solutions may appear simple, their execution will doubtless prove otherwise. For those leading an "average" or "typical" lifestyle, thoughtful and significant changes are unavoidable. Second, ample portions of vegetables and fruits are the mainstays of any successful diet. Lean unprocessed meats (fish especially), healthy oils, dairy, and whole grains—though clearly valuable—should probably be conceived of as nutritional supplements, not as staples. Empty calories, including all sweets and processed grains, should be erased from the menu until personal experimentation reveals them tolerable to whatever extent. Finally, each individual must fashion his or her own solution. Even the most successful popular diets should be scrutinized for their respective strengths and weaknesses, and then summarily rejected.

Tragically, the politics of frustration and anger have intruded deeply into the obesity discussion, as numerous readers have suggested. Concerned citizens are frequently implored or even coerced to deny the only interventions that have ever succeeded: those that emphasize education, individual experimentation, and personal responsibility. In their absence, we are encouraged instead to blame legitimate businesses and a faceless and unoffendable community for the obese person's choices at the supermarket, restaurant, and home.

Taubes, Lustig, and others claim that personal responsibility is irrelevant. They allege that the biological obstacles for certain obese individuals are insurmountable and, as such, that no obese person should ever be asked to make informed, rational choices. Yet incredibly, each writer's new book offers dietary instruction. They advocate as well for continued research into the science of nutrition as it relates to obesity. A fine idea. However, one wonders what desirable interventions could possibly result that demand no measure of personal responsibility.

Of course some of us are biologically predisposed to obesity—myself included. Why should it surprise us that severely excessive adiposity results from any number of physical problems or abnormalities? And even among the obese, some solutions will prove more difficult than others. Nevertheless, well-intentioned, science-minded commentators shouldn't try to convince us that obesity can't be overcome until the evidence clearly confirms as much.

Impressionable yet intelligent, motivated children deserve far more forthright and inspiring counsel. In truth, obesity can be and often is effectively confronted, and obese children especially deserve the chance to regard their situation as an opportunity for accomplishment and not as an excuse for regression to mediocrity. ■

Notes

1. Standard BMI categories, calculated as weight in kilograms divided by height in meters squared, were reported in 1997 from the World Health Organization Consultation on Obesity and adopted in 1998 by the American National Heart, Lung, and Blood Institute. In her team's study, Flegal used the latter organization's current terminology: underweight (BMI of <18.5), normal weight (18.5–<25), overweight (25–<30), and obese (≥30). More specifically, she also defined grades 1, 2, and 3 obesity as corresponding to BMIs of 30–<35, 35–<40, and ≥40, respectively. However, all BMI categories are controversial because they fail to differentiate between lean muscle mass and fat mass or subcutaneous fat (less dangerous) and visceral fat (more dangerous).

2. But for a sociologist's critical examination of how obesity has come to be defined as a social crisis of epidemic proportions, see Boero, Natalie. 2012. *Killer Fat: Media, Medicine, and Morals in American "Obesity Epidemic."* Rutgers University Press.

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Did Psychic Visions Locate Missing California Boy?

Q: Have you heard this news story about a California psychic who found a missing boy, and the police are confirming it? I've been hearing a lot about it. Do you think this is the new best case for psychic detectives?

—J.D. Mack

A: Yes, there's a new "best case" for psychic detectives! Let's see if it's a stronger case than the last "best case" for psychic detectives I investigated (see "The Psychic and the Serial Killer," Skeptical Inquirer, March/April 2010). Here's the news story: The search for an eleven-year-old California boy missing since July 7, 2013, came to a tragic end three days later when the body of Terry Smith Jr. was found buried in a shallow grave near a tree not far from his home in the Riverside County community of Menifee. A woman named Pam Ragland, who claims to have psychic or intuitive powers, is being credited by police and others as having located the boy through her visions even though police had already searched the area.

Driven by recurring visions of the boy along with a distinctive home and tree, Ragland called a tip line and was encouraged to drive to Menifee to search. So she did, joined by her two children and an off-duty fireman who offered to help. They searched the area where the boy was last seen, the Smith property, and found to Ragland's astonishment that a home and tree matched her visions—even though she lived sixty miles away and had never been to the location.

Psychics claiming to find missing persons is not new, but Ragland's account has been confirmed by police. Riverside County sheriff's spokeswoman Sgt. Lisa McConnell confirmed that Ragland had located the body, and detective John Powers was quoted as saying that he was amazed at how Smith had been found: "Not in 23 years have I ever seen anything like this."

Assuming the basic facts are true as reported, it's a genuinely bizarre story, and within days it was being discussed as an amazing "best case" for psychic detectives. Many news reports stated that a psychic directly led to the boy's recovery; the *Vancouver Sun*, for example, offered the July 13 headline "Psychic Finds Missing Boy's Body in California," and a CBS News headline crowed, "Police: Psychic Found Body Of Murdered 11-Year-Old Boy."

The case is strange and intriguing, but perhaps not unexplainable. Clues to solving the mystery may lie in psychology and statistics.

Prophetic Visions?

Since Ragland had never met the Smith family or been to their property, how could she possibly have recognized their home from her psychic visions? The answer is simple: She saw it on television. Ragland stated that she had been following the extensive news coverage about the missing boy, and that she had her first visions about him while she was watching a news report about the search.

Television reports included photographs and video footage of the Smith home and property, and Ragland had indeed seen the Smith property before she arrived there, whether she remembered it or not. The fact that a house and tree in her vision "matched" the house and tree where Smith was found is not surprising. It is merely evidence of not remembering where she saw an image, not psychic powers.

Psychics or Statistics?

Why would Ragland suddenly get a vision of Smith's location, correct or otherwise? She believes that she and her children are "intuitive" and that the senses, ideas, and intuitions that come to her are important. She had been focusing on conjuring or receiving feelings about the missing boy and clearly assumed that whatever impressions came to her were relevant and meaningful.

This is not unusual; in high profile missing persons cases it is common for police to be inundated with hundreds or thousands of visions, hunches, and feelings from psychics, most of which are contradictory and all of which turn out to be wrong. Despite popular belief and claims to the contrary, there is not a single documented case of a missing person being found or recovered due to psychic information.

Like Ragland, many psychics genuinely believe in their powers and abilities and are sincerely trying to help. Over the course of many missing persons cases and tens of thousands of visions and predictions, eventually some of them will turn out to be correct simply by chance. In this case, however, Ragland's odds of correctly guessing where Smith's body would be found were much better than chance.

This is because it's a statistical fact that most homicide victims, including children, are killed by a family member. There are exceptions, of course, but the odds are that a missing or murdered child will be found in or near the family home. Given the profile of the alleged killer, reported to be Smith's sixteen-year-old half-brother, it's likely that the boy's body would be found near where he was last seen (the family's home), and not, for example, hundreds of miles away.

Pam Ragland could not have known this, of course, but the point is that police and searchers had already identified the Smith property and nearby areas as among the most likely places where Terry Smith Jr., alive or dead, might be found. In other words, Ragland's visions of the Smith house, which likely came to her through TV news reports instead of ESP, happened to also be where Smith would most likely be found—as indeed he was.

It's also worth noting that Ragland's visions of Smith were, by her own account, wrong. She described seeing a young boy lying on his side with his eyes closed: "I couldn't understand why he wasn't moving," she said in an Associated Press interview. "He had his eyes closed, but I just thought he was sleeping." Yet her vision of a peaceful sleeping boy was wrong; instead what she and her children found near a tree on the Smith property was described as a blackened, bloated head with half of the nose and an eye missing.

Ragland did not show up at the Smith property by random chance or psychic vision. Instead, after driving to the town of Menifee where the search command center was located, she met an off-duty fireman who drove her around the area. Ragland may or may not have known that the property they were visiting was that of the Smith family—where she would soon recognize the scene from her "visions" or news coverage—but her fireman guide surely did.

Once Ragland and her children were on the Smith property, it was the smell of the boy's decomposing body—not a psychic vision—that helped them locate the corpse. In fact, Ragland did not find Smith's body; her daughter Sydnee found the boy's body while investigating the stench. It's not as if Ragland contacted the police with a detailed, accurate description of where Smith's body could be found.

The fact that police and searchers may have missed Smith's body—which, after all, was found not far from the Smith home—is troubling and may suggest incompetence, but is not as incredible as it may seem at first glance. Police and searchers are only human, and it is not unheard of for a piece of evidence, or even a body, to be found in an area previously searched. Furthermore at the time of the initial searches of the property, Smith—reported to be a high-functioning autistic—was assumed to be alive. Searchers were looking for a lost eleven-year-old boy, not necessarily a body in a shallow grave. It is also possible that the body was buried there after the area was searched.

There remain many unanswered questions in this case, including about Ragland's role in Smith's recovery. Police, quite understandably, have investigated the possibility that she might have had some role in Terry Smith Jr.'s disappearance. Unless, of course, she got her information from psychic powers or divine visions.

What seems at first like an amazing, iron-clad "best case" of psychic detective powers may not be so unexplainable with the application of critical thinking, psychology, and skepticism.

Yet there is a third, more likely option: Ragland is neither psychic nor involved in any crime, but simply someone who unknowingly mistook a television news scene for an intuitive vision and whose instincts correctly told her where the missing boy was statistically most likely to be found—and eventually was.

What seems at first like an amazing, iron-clad "best case" of psychic detective powers may not be so unexplainable with the application of critical thinking, psychology, and skepticism. The scientific principle of Occam's Razor suggests that, other things being equal, the simplest explanation is often the correct one. Either Pam Ragland is the first person in history to find a missing person through psychic visions, or the accuracy of her predictions was due to a combination of psychology, statistics, and luck. ■

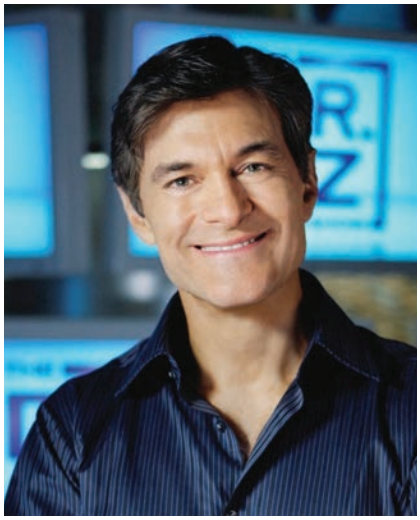
Dr. Oz's Questionable Wizardry

JOE SCHWARCZ

Miracles are pretty rare events. Except on television's *Dr. Oz Show*, where they appear with astonishing frequency. Oz of course doesn't claim to raise the dead or part the Red Sea, but he does raise people's hopes of parting with their flab. And he's certainly not shy about flinging the word *miracle* about. But it seems miracles fade as quickly as they appear. Raspberry ketones, acai berries, and African mango, once hyped as amazing "fat busters," have already given way to newer wonders.

Granted, Dr. Oz—or more likely his producers—do not pull miracles out of an empty hat. They generally manage to toss in a smattering of stunted facts that they then nurture into some pretty tall tales. Like the ones about chlorogenic acid or Garcinia cambogia causing effortless weight loss. The former piqued the public's interest when the great Oz introduced green coffee bean extract as the next diet sensation. Actually "chlorogenic acid" is not a single compound but rather a family of closely related compounds found in green plants, which perhaps surprisingly contain no chlorine atoms. The name derives from the Greek "chloro" for pale green and "genic" meaning "give rise to." (The element chlorine is a pale green gas, hence its name.)

It was an "unprecedented" breakthrough, Oz curiously announced, apparently having forgotten all about his previous weight-control miracles. This time the "staggering" results originate



from a study of green coffee bean extract by Joe Vinson (2012), a respected chemist at the University of Scranton who has a long-standing interest in antioxidants, such as chlorogenic acid. Aware of the fact that chlorogenic acid had been shown to influence glucose and fat metabolism in mice, Vinson speculated that it might have some effect on humans as well. Since chlorogenic acid content is reduced by roasting, a green coffee bean extract was chosen for the study.

In cooperation with colleagues in India who had access to volunteers, Vinson designed a trial whereby overweight subjects were given, in random order, for periods of six weeks each, either a daily dose of 1,050 mg of green coffee bean extract, a lower dosage of 700 mg, or a placebo. Between each six-week phase there was a two-week "washout" period during which the participants took no supplements. There was no dietary intervention; the average daily calorie intake was about 2,400. Participants burned roughly 400 calories a day with exercise. On average there was a loss of about a third of a kilogram per week. Interesting but hardly "staggering." And there are caveats galore.

The study involved only eight men and eight women, which amounts to a very statistically weak sample. Their diet was self-reported, a notoriously unreliable method. The subjects were not really blinded since the high-dose regimen involved three pills and the lower dose only two pills. A perusal of the results also shows some curious features. For example, in the group that took placebo for the first six weeks, there was an eight kilogram weight loss during the placebo and washout phase, but almost no further loss during the

high-dose and low-dose phases. By the time, though, that critics reacted to Oz's glowing account, overweight people were already heading to the health food store to pick up some green coffee bean extract that might or might not contain the amount of chlorogenic acid declared on the label. As for Dr. Oz, he had already moved on to his next "revolutionary" product, Garcinia cambogia, unabashedly describing it as the "Holy Grail" of weight loss.

We were actually treated to the Grail in action. Sort of. Dr. Oz, with guest Dr. Julie Chen, performed a demonstration using a plastic contraption with a balloon inside that was supposed to represent the liver. A white liquid, supposedly a sugar solution, was poured in, causing the balloon, representing a fat cell, to swell. Then a valve was closed, and as more liquid was introduced, it went into a different chamber, marked "energy." The message was that the valve represents Garcinia extract, which prevents the buildup of fat in fat cells. While playing with balloons and a plastic liver may make for entertaining television, it makes for pretty skimpy science.

While playing with balloons and a plastic liver may make for entertaining television, it makes for pretty skimpy science.

Contrary to Dr. Oz's introduction that "you are hearing it here first," there is nothing new about Garcinia. There's no breakthrough, no fresh research, no "revolutionary" discovery. In the weight-control field, Garcinia cambogia is old hat. Extracts of the rind of this small pumpkin-shaped Asian fruit have long been used in "natural weight loss supplements." Why? Because in theory, they could have an effect.

The rind of the fruit, sometimes called a tamarind, is rich in hydroxycitric acid (HCA), a substance with biological activity that can be related to weight loss. Laboratory experiments indicate that HCA can interfere with an enzyme that plays a role in converting excess sugar into fat, as well as with enzymes that break down complex carbohydrates to simple sugars that are readily absorbed. Furthermore, there are suggestions that Garcinia extract stimulates serotonin release, which can lead to appetite suppression.

Laboratory results that point toward possible weight loss don't mean much until they are confirmed by proper human trials. And there have been some: fifteen years ago a randomized trial involving 135 subjects who took either a placebo or a Garcinia extract equivalent to 1500 mg of HCA a day for three months, showed no difference in weight loss between the groups (Heymsfield et al. 1998). A more recent trial (Kim et al. 2011) involving eighty-six overweight people taking either two grams of extract or placebo for ten weeks echoed those results. In between these two major studies there were several others (Onakpoya et al. 2011), some of which did show a weight loss of about one kilogram over a couple of months, but these either had few subjects or lacked a control group.

Basically, it is clear that if there is any weight loss attributed to Garcinia cambogia, it is virtually insignificant. But there may be something else attributed to the supplement, namely kidney problems (Li and Bordelon 2011). Although incidence is rare, even one is an excess when the chance of a benefit is so small. So Garcinia cambogia, like green coffee bean extract, can hardly be called a miracle. But it seems Dr. Oz puts his facts on a diet when it comes to fattening up his television ratings. ■

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Illustration by Neil Davies

THE PSYCHIC

Years Later, Sylvia Browne's Accuracy Remains Dismal

An update of our "Psychic Defective" analysis examines developments in eleven cases Sylvia Browne made predictions about, explores a new reading, and scrutinizes her other failed predictions about the papacy and American politics.

RYAN SHAFFER

Sylvia Browne continues to offer $850 phone readings, sell books, deliver public lectures, and head her own church as she remains one of the most famous psychics in the United States. My 2010 coauthored article, "Psychic Defective: Sylvia Browne's History of Failure," compiled every publicly available prediction Browne made on missing person and death cases, totaling 115 readings, and concluded Sylvia Browne was mostly correct zero times, mostly wrong in twenty-five cases, and had ninety unknown outcomes (Skeptical Inquirer, March/April 2010). In the last three years there have been developments in the cases of Amanda Berry, Nicholle Coppler, Jerry Cushey, Alexandra Ducsay, Dustin Ivey, Hunter Horgan, Amanda Lankey, Christopher Mader, Dena McCluskey, Michelle O'Keefe, and Pat Viola that were listed as having unknown outcomes.

This article updates the previous analysis with a new reading, bringing the total to 116 cases, and investigates changes in those eleven cases with previously unknown conclusions by showing Browne mostly wrong in eight, with three remaining in the unknown category. The result? The evidence demonstrates Browne still has never been mostly correct in a single case, thirty-three cases have mostly incorrect predictions, and eighty-three cases have unverified outcomes. The article also looks at the human toll Browne's predictions have had and other notable predictions that can be finally evaluated.

Dan Callister, PacificCoastNews./News.com

In 2004 Browne told the mother of Amanda Berry that "she's not alive." Amanda and two other girls escaped captivity on May 6, 2013.

On April 21, 2003, Amanda Berry went missing a day before her seventeenth birthday. Louwana Miller, Berry's mother, was desperate to find her daughter and believed Browne was the key to solving the disappearance. In 2004, Miller was flown to *The Montel Williams Show* where Browne told the grief stricken mother that "she's not alive," mentioned "water" as a location where Berry was, and said she was dead because "your daughter was not the type that would not have called you" (Radford 2013). Besides claiming that a potential person of interest was "sort of Cuban-looking, short kind of stocky build, heavyset," she said he was "maybe 21, something like that, 21, 22." When Miller asked if she would ever see her daughter, Browne told the bereaved mother, "yeah, in heaven, on the other side."

The impact of Miller's appearance with Browne on *Montel* was crushing for a mother who held out hope her daughter would be found alive. In a detailed interview with Miller by Stephen Hudak, the mother said she believed Browne "98 percent" (Hudak 2004). When Miller died of heart failure in 2006, reporter Regina Brett explained how hard Miller worked at drawing attention to the case and looking for her daughter "before that psychic did her in" (Brett 2006). According to that article, Browne was more specific than what was aired

DEFECTIVE REVISITED

on television, telling Miller that Amanda "died on her birthday," "she didn't suffer," and "that her black hooded jacket was in a dumpster with DNA on it."

Browne's prediction was wrong. On May 6, 2013, Berry fled after being held in torturous conditions for ten years, and police called Berry a hero for her escape that led law enforcement to her kidnapper and two other abducted girls, Gina DeJesus and Michelle Knight. DeJesus had been missing since 2004 and Knight was kidnapped in 2000. In the chilling phone call to police, Berry identified herself as Amanda Berry, missing for ten years and said her captor was Ariel Castro, a fifty-two-year-old man. In a statement posted on Browne's website, a message says Sherry Cole, Amanda Berry's cousin, "reached out to Sylvia this morning to let her know that she supports her, loves her, knows Sylvia never claims to be 100 percent right, but wanted to let her know that she was accurate in her description of the perpetrators at the time" ("Sylvia's Statement on Amanda Berry" 2013). That Castro, born in Puerto Rico, is "Cuban-looking" is debatable for several reasons, including the fact that being Cuban is a nationality that includes a broad category of people who have immediate ancestors from Africa, Europe, or both. Thus, in the broadest sense many people, not just Latin Americans, could fit that description. Browne was wrong about the kidnapper's age; she claimed in 2004 that the person involved was about twenty-one or twenty-two, but Castro is currently fifty-two, making her claim off by two decades, as he was in his early forties at the time. Her description was also that the suspect was "short," but an online booking photograph shows he is about sixty-five inches (AP Photo 2013), which is only slightly smaller than the most recent U.S. government data that lists an average height of 67.1 inches for Hispanic males between forty and fifty-nine and 69.5 inches of all males between fifty and fifty-nine (United States Department of Health and Human Services 2010). Castro may have a "stocky build," but he does not appear to be "heavyset." The website statement also referred to Browne's description of the "perpetrators," despite police announcing Castro "ran the show and he acted alone" (Dolan et al. 2013). This reading is moved into the wrong category of the "Psychic Defective" list.

Browne remains relatively quiet on Berry's rescue aside from saying her "heart goes out to Amanda Berry," but in 2012 Browne's website posted a video of her 2002 *Montel* appearance about Nicholle Coppler. In citing the case as a "validation," Browne wrote she accurately told the mother that Nicholle Coppler "was no longer alive and could be located in or under the house and that the person who killed her was also involved with both young boys and girls" ("Webcast Previews" 2012). When Coppler went missing in 1999, she ran away from home and met an older man, Glen Fryer. Police suspected Fryer was involved in the disappearance early on, and in August 2001 they not only found Coppler's identification at his house but also her hair and photos. He was arrested for rape and child pornography after police retrieved videos and photos of him raping underage girls, including a girl who was murdered in Kentucky in 2000. Fryer, who was a suspect in his wife's murder as well, agreed to a plea deal, but on February 18, 2002, he committed suicide before telling detectives what he did to Coppler.

Nine months *after* the guilty plea and suspect's death in 2002, Nicholle's mother, Krista Coppler, appeared with Browne in November 2002 on *Montel* where she told Krista the obvious outcome that Coppler is deceased. The mother asked, "Do you know where she's at?" and Browne replied, "She's right near his house." Krista then

Cuyahoga County Jail/ZUMA Press/Newscom

Booking photo of Ariel Castro shows that Browne was wrong about the person of interest being "short" and "maybe 21 years old." On July 26, 2013, Castro pleaded guilty in the imprisonment and rapes of Amanda Berry and two other girls who escaped in May.

asked Browne, "Is she in his basement?" and Browne responded vaguely with "yeah, in the house or under the house." According to *Lima News* in 2012, "police found her skeleton after the house was demolished and while the foundation was being dug out" (Sowinski 2012). Out of the entire reading Browne was correct on the most likely scenario given Fryer's guilty plea, suicide, connection to two previous murders, and the evidence: Coppler was deceased. Her other predictions about Coppler being "under" the house, "near" the house, that she was "smothered," that Fryer transported girls "across state lines," that she did not leave the house, that people named Kevin and Billy were involved, three males were involved, or that she was killed out of fear for reporting Fryer's crimes are either wrong or unsubstantiated. For example, Coppler's remains cannot be "near" or "under" the house while also being "in" the house.

In total, Browne's "validated" statements for the Coppler reading were one or, at best, two out of ten predictions (counting the body buried next to the foundation as either "in" or "under" the house as per Browne's website claim). Accepting the body as being "in" the house makes Browne's two other statements about the remains resting "near" or "under" the house incorrect. Therefore in this reading with ten claims, Browne has a 10 percent or, at best, 20 percent accuracy, while 20 percent of her statements were wrong and the remaining 60 percent of her statements, including cause of death and possible accomplices, are unknown. Due to a lack of evidence that could either confirm or deny Browne's other six statements, this reading remains in the unknown outcome category. This case is also a revealing look at how Browne operates. In the transcript, it was Krista's statements about Fryer's basement that prompted Browne to focus on the home's interior. Furthermore, nearly ten years lapsed between the reading and finding her remains; law enforcement found the deceased and Browne played no role in police locating the body.

Browne was also proved wrong in her predictions about the August 1992 murder of Hunter Horgan, a priest at St. John's Episcopal Church in Louisiana. In 1997, Browne was paid $400 by local police for the reading in which she claimed, "The priest was killed by a 'young mulatto' homosexual who was enraged by Hunter's rejection of his advances" (McMillan 1997). The psychic said, "Someone was in love with the minister and he [the minister] wasn't predisposed to be in love with a man" and the "priest was trying to help him" (McMillan 1997). While Browne said she expected the perpetrator "to get caught," she claimed that "somebody with the street name of 'King' directed gang people to do it," but when asked for a name she declined, saying, "she is concerned about the ethics of doing so" (McMillan 1997).

In 2007, the investigation was reignited in what turned out to be a highly unusual case that Browne failed to predict. After re-interviewing two men, police accused Derrick Odomes, an African American who lived across from the church cemetery, of robbing and murdering Horgan and obtained DNA and fingerprints from Odomes that linked him to the crime. As it turned out, Horgan was robbed. Both his wallet and car were stolen, and police found his pants pockets were "turned inside out" (Monroe 2011). The trial was slow to move forward because Odomes's lawyer argued he should be tried as juvenile, because Odomes was fourteen in August 1992 and therefore legally a juvenile. In August 2011, Odomes, at age thirty-three was found guilty for the murder he committed as a fourteen year old. The judge sentenced Odomes to incarceration until he was twenty-one, but since he was over that age he did not serve any time and faces life in prison for other charges (Nolan 2011). As for Browne's predictions on the murder, a gang was not involved, multiple people did not commit the crime, no "homosexual advances" were motivating factors, there was no evidence Odomes loved Horgan, no mentions about Odomes being "mulatto," and no person named "King" was involved. Browne's prediction is placed in the wrong category, since most of her claims were not supported by fact or they indeed contradicted what was presented at trial.

In the Horgan—Odomes case, Browne's prediction is placed in the wrong category, since most of her claims were not supported by fact or they indeed contradicted what was presented at trial.

In 2003, Browne gave a reading to Sonya Helmantoler on *Montel* about the 2001 disappearance of her brother Jerry Cushey Jr. A transcript of the reading could not be located, but a journalist at the time wrote: "Browne said Cushey had been struck on the head and choked and his body dumped," pointing to "how hard it is to find a body in water" (Smydo 2003). Another journalist wrote that "Browne told Helmantoler on *The Montel Williams Show* that Jerry was killed because he saw something he shouldn't" (Brubaker 2006). In 2010, Ronald Curran and Christopher Myers, Cushey's roommate, were charged with the shooting death of Cushey and hiding his body over a drug debt Cushey owed. In 2011, Myers pled guilty and Curran pled guilty in 2012 (Buckley 2012). Myers took police to the two locations where they buried Cushey's body in wooded areas (Buckley 2010). Browne's statements about the reason, manner of death, and location of

the body were false. This was a mostly wrong prediction and has been moved to that category.

On October 11, 2006, Browne did a reading about the death of Alexandra Ducsay for Linda, her mother, and said her daughter's murderer is "sort of like" the "Zodiac Killer." Browne gave a name, but it was censored by *The Montel Williams Show*, claiming he "got in and followed her in" and it was linked to "four" other women who were found and told the mother to search for rapists in the area. In September 2012, Matthew Pugh, Alexandra's former boyfriend, was charged with murder and burglary after a small piece of tape led police to him (Juliano and Cleary 2012). Pugh is only accused of one murder, but as he is awaiting trial this case will remain in the unknown category.

In contrast, Browne gave more detail in her October 26, 2005, reading on *Montel* for Tamara Ivey, mother of deceased Dustin Ivey, by saying a teenage boy and a "dark-haired young" female were involved. Said Browne, "I think it's going to be solved really soon" and "a sexual predator" was the suspect who used "a rock." Tamara replied, "They told me that it wasn't sexual." In 2006, Richard Joshua Collier, Dustin's brother and Tamara's son, was charged with Dustin's murder. Police claimed the two got into an argument and Collier killed his brother. He was found not guilty at trial (Stoner 2007). If the police and the prosecutor's charges are correct and Browne was right about the case being solved "soon," then all other details in Browne's reading were false. Conversely, if the charges were wrong then Browne's timeline as well as the nature of his death were incorrect. Browne's verifiable statements in either instance were mostly incorrect, which puts this reading in the wrong category.

On February 8, 2006, Amanda Lankey's 2004 murder was featured on *Montel*, where Browne spoke with her mother, Victoria Foster. Browne asked, "Do you know anybody by the name of [censored]" to which the mother said yes. Browne claimed, "There was also a female involved with the first initial of 'C,'" and Browne said Amanda was killed in a "car," specifically a blue Honda Civic. Browne said Amanda met the person on the Internet. In 2004, Cecil Wallis Sr. was immediately named a person of interest in the murder because Lankey was last seen alive at his house and her body was found not far from that location. In 2011, Wallis Sr. committed suicide before trial in an unrelated rape case involving teen girls at the same home between 1998 and 2002 (Tunison 2011). Assuming Cecil Wallis Sr. was behind the murder, there is no evidence a female with a "C" was "involved," and Browne was wrong about how the person met Lankey. Cecil Wallis Sr. was not charged with Lankey's murder, and without more evidence or a trial there are too many unknowns. Thus, this case remains in the unknown category.

Sylvia Browne's November 30, 2005, reading for Samantha Mader, mother of Christopher Mader, had a much clearer outcome. Browne gave the mother a name, which was again censored, and claimed Christopher's murder stemmed from the killer not liking "the food" at the bar he worked at, then later the killer "saw him passing by, and shot him." Browne also told the mother to start looking "where he ate breakfast." Matthew Correll and Shawn Myers were charged with the murder, and Correll was found guilty and Myers pled guilty in 2012 (Newman 2012). The two had attempted to rob Mader. Browne's predictions were not true about how many people were involved, the reason for the murder, or how the crime happened. This case has been put in the wrong category.

On February 26, 2003, Browne made predictions for Dena McCluskey's stepmother Donna, asking the stepmother, "Who is David?" and Donna responded, "David doesn't ring a bell at all." Browne then said, "She's in like a basement thing" locally and "the reason I brought up David is because David, with an 'L,' last name 'L,' like something like [censored] or something, knows about this." In 2007, the police found Dena McCluskey's body "in a secluded area of Tuolumne County" and arrested Russell Todd Jones for her murder (Ahumadara 2007). In 2011, Jones was found guilty of voluntary manslaughter in the killing of Dena McCluskey, Jones's roommate (Ahumadara 2011). He admitted to burying her body in a shallow grave near property owned by his parents after burning her body. Browne's predictions were false. There was no David involved, or an "L" last name, she was wrong about the body's location and a "basement" and failed to mention that the person involved was her daughter's roommate. This reading is moved into the wrong category.

Russell Todd Jones admitted to burying Dana McCluskey's body in a shallow grave near property owned by his parents after burning her body. Browne's predictions were false.

In October 2000, Browne sat down with Patricia O'Keefe, the mother of Michelle O'Keefe, who was murdered in February 2000. A transcript could not be located, but according to news reports Browne said the killer was "a blue-eyed, dark-skinned white man named Lee or Leon, who fled the scene on a shuttle bus" (Botonis 2000b). She further obfuscated, saying the murderer is "very dark-complected and could be mistaken as being black" and "he had a blue uniform with a pocket and a badge

or something over it" (Botonis 2000b). Browne then claimed O'Keefe's murder was part of a series of murders at that location and that the gun used in the murder could be found "in a large green metal trash can next to an elevator or door" that had not been emptied since the murder eight months before. In response to the taping, police announced they were following the tips Browne offered not because they believed her, but "you don't reject any information," as "a person could say they're a psychic and really be trying to give you information either firsthand or from another source" (Botonis 2000a).

In late 2009, Raymond Lee Jennings was found guilty after three trials for Michelle O'Keefe's February 2000 murder and was later sentenced to forty years. Long before Browne's October 2000 reading, on April 4, 2000, Jennings was told by police he was the suspect in the murder (Brown 2012). Jennings, a security guard at the school where O'Keefe was killed, was the sole witness and told conflicting accounts of what happened (Fausset and Blankstein 2001). For example, he told investigators about when he first saw O'Keefe, which contradicted his earlier statements and physical evidence (Fausset and Blankstein 2001). While Browne was wrong about the suspect being named Leon, she was correct about one of his names being Lee. Browne's website celebrated this fact by promoting a *Dateline* episode showing Browne saying it was a "white man named Lee or Leon, who fled the scene on a shuttle bus," which had no further analysis or clips from the show ("The Girl With The Blue Mustang" 2010). It is important to note that Raymond Lee Jennings was named as the suspect less than two months after the murder and six months *before* Browne's involvement. This case received national attention before Browne's reading, and O'Keefe's murder was even featured on *America's Most Wanted* in the summer of 2000. No physical evidence, such as a gun, was discovered despite Browne's claims and police following up on her statements. She was correct about the name Lee, being white, and eye color, which could have been surmised by anyone who followed the case knowing that Jennings had been the suspect since April. Browne was wrong about the Leon name, his being "dark-skinned," "very dark-complected," "could be mistaken as being black," and he did not "flee," as he stayed at the scene and did not take "a shuttle bus." Furthermore, Browne's claims about where the gun was were false, and O'Keefe's death was not part of a series of other murders. While one might expect a security guard to have a blue uniform and a badge, this was not the case. According to the *Dateline* episode, his uniform consisted of black pants, a black jacket, and a brown shirt. The shirt had the company's red logo with a pattern of a badge on the sleeves and chest, but it was not a badge, and Browne's claim that it had "something over it" is unclear. So while she was correct on three statements that police already knew months before, Browne was wrong on at least ten claims. This reading is moved into the mostly wrong category.

Similarly, on February 11, 2004, Browne conducted a reading for Jim Viola, whose wife Pat Viola went missing from Bogota, New Jersey, in 2001. The psychic said she "had a major seizure," was then given a ride by a grocery truck driver, and the husband needed to look in Akron, Ohio (Mahabir 2004). In September 2012, authorities announced they had Pat Viola's body since July 27, 2002, when they found it washed ashore on a Rockaway beach in New York. DNA tests of the bones were taken in 2006 and new samples from 2011 led to the identification (Baustista and Superville 2012). Pat Viola was dead at the time of Browne's reading so she could not have been alive in Ohio since her remains were in New York. This reading is moved to the mostly wrong category.

Browne's dismal record has not dissuaded people from asking her questions about criminal cases. In 2011, she was asked by Angela Spinks, in front of an Albuquerque, New Mexico, audience, who killed Lloyd, Dixie, and Steven Ortiz, her parents and brother, with a pickaxe on Father's Day. According to journalist Nico Roesler, Browne told Spinks the murderer was Jesse Rios, her brother-in-law (Roesler 2012). The police had previously questioned Rios and his wife Cherie Ortiz-Rios, who found the bodies and lived on the property (Roesler 2012). An official with the New Mexico state police "told the family to disregard Browne's answer because the show was rigged and that it was a stunt" (Roesler 2012). The murders remain unsolved, and it is unclear what, if any, information Browne knew about the triple homicide from the media. Adding this case to the list of Browne readings with unknown outcomes to the "Psychic Defective" article brings the total to 116 cases total with eighty-three unknown outcomes.

Browne has never been mostly accurate out of 116 readings, with thirty-three cases mostly wrong and eighty-three unverified predictions.

These readings are not Browne's only miserable predictions in recent years. Browne predicted in *Prophecy* (2005): "After Pope John Paul II passes, there will be only one more elected pope" and wrote "he will be succeeded by what is essentially a triumvirate of popes" (Browne and Harrison 2005). In 2013, Pope Benedict XVI resigned, the first in nearly 600 years, and Pope Francis was elected, becoming the first pope from the Americas. Browne's predictions about the Pope were wrong, and she failed to predict these rare moments in the papacy. In *End of Days* (2008)

Browne made predictions such as: "Many of the dramatic advancements in our space travel will be the direct result of what we've learned from them, from the manned Mars exploration in 2012" (Browne and Harrison 2008). There was no 2012 mission to Mars. In 2011, Browne predicted Mitt Romney would defeat Barack Obama in the 2012 presidential election, only to reverse herself in late September 2012 when Romney was trailing in polls and received negative press for his private comments made to donors (Skomal 2011).

If one focuses only on the missing person cases, Browne's prediction about Amanda Berry was not even the first time Browne told a mother her child was dead when the missing child was alive. In 2003, Browne told the parents of Shawn Hornbeck he was dead, but he was found alive in 2007. After her failed prediction received media attention, Browne released a statement to CNN's Anderson Cooper saying: "She cannot possibly be 100 percent correct in each and every one of her predictions. She has, during a career of over 50 years, helped literally tens of thousands of people" ("Psychic Told Parents That Son Was Dead" 2007). The question is, if Browne cannot be 100 percent accurate then just how accurate is she? The Ortiz reading has been added to the metric, while Browne was wrong in the cases of Amanda Berry, Jerry Cushey, Dustin Ivey, Hunter Horgan, Christopher Mader, Dena McCluskey, Michelle O'Keefe, and Pat Viola. The Nicholle Coppler, Alexandra Ducsay and Amanda Lankey cases remain on the unknown list. Following these recent updates to the "Psychic Defective" article, Browne has never been mostly accurate out of 116 readings, with thirty-three cases mostly wrong and eighty-three unverified predictions. ■

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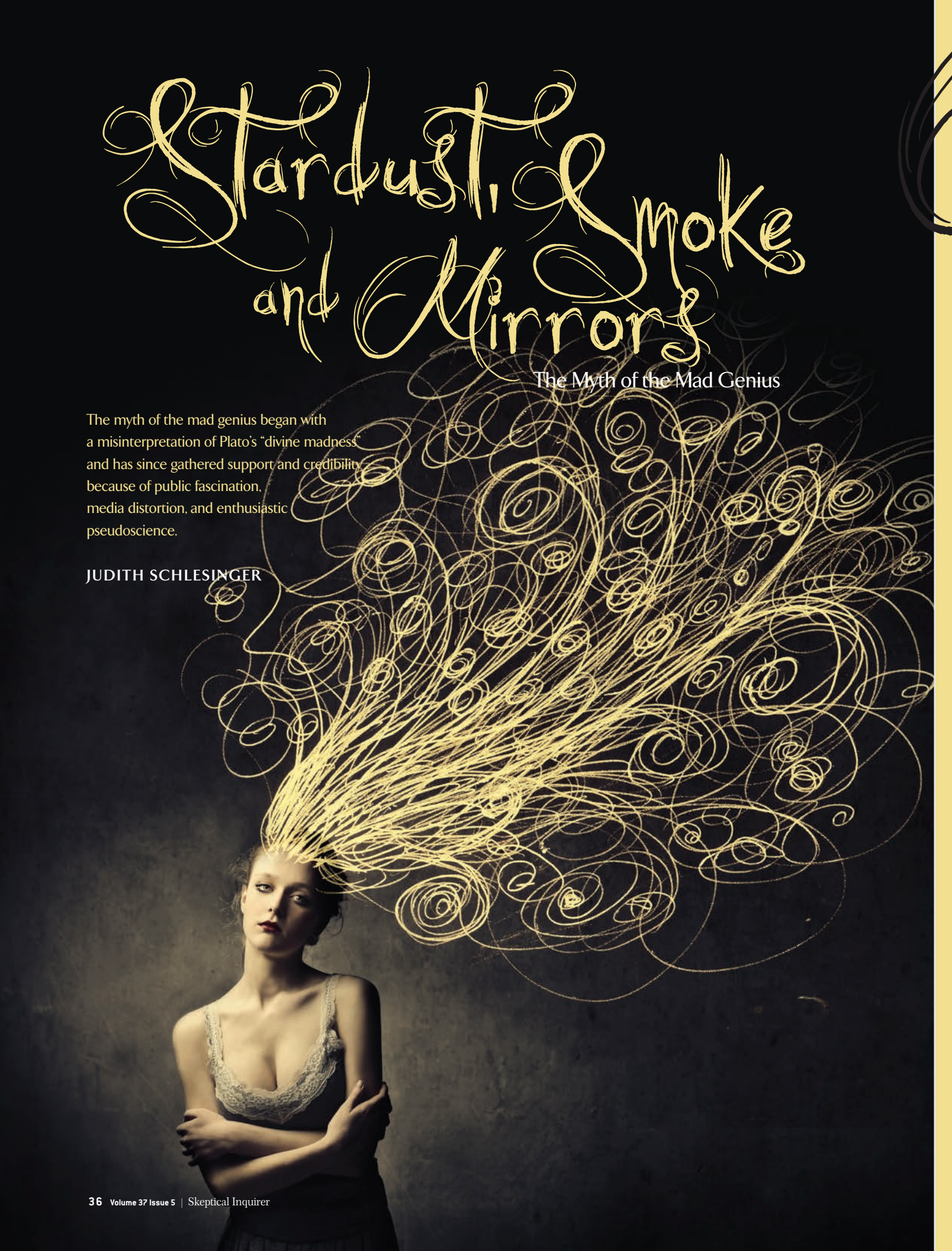
Stardust, Smoke and Mirrors

The Myth of the Mad Genius

The myth of the mad genius began with a misinterpretation of Plato's "divine madness" and has since gathered support and credibility because of public fascination, media distortion, and enthusiastic pseudoscience.

JUDITH SCHLESINGER



Most myths are popular because they offer quick solutions to the world's ongoing puzzles, whether found in nature or in the baffling variations in human behavior. This is especially true when a myth is ancient, photogenic, and has a whiff of science about it. The mad genius myth qualifies on all counts, deriving its credibility from expert proponents (hereinafter called "mythers") who proclaim the existence of a solid empirical link between great creativity and bipolar disorder, so that those who are blessed with the one must also be saddled with the other. This equation is patently false but too rarely challenged, even by mental health professionals who should know better, for reasons that will soon be explained. Meanwhile, the tragedy of the mad genius myth is that it encourages viewing the genius through a warped, dusty, and generic lens; this not only negates the individualism of society's most exceptional talents, it also diminishes their accomplishments as a product of mental disturbance.

Popularity and Power

The myther's favorite poster boy is Vincent van Gogh, whose painting *Self-Portrait with Bandaged Ear* supplies their most convenient visual. Chances are this will continue despite new indications that someone else may have severed that famous lobe—this would be his roommate Paul Gauguin, who was notorious for his hot temper as well as his skill with a sword. Scholars have found intriguing clues to this alternate scenario among van Gogh's 874 letters, which were posted in 2010 at www.vangoghletters.org. But such facts will matter little to mythers, whose exclusive focus on internal pathology tends to minimize the impact of external stressors and events on the life of the artist.

In van Gogh's case, this requires discounting his poverty, loneliness, and repeated romantic and occupational failures, as well as the physical consequences of epilepsy, absinthe poisoning, and late-stage (tertiary) syphilis; moreover, when viewed from this narrow perspective, his suicide stands unexamined as the ultimate proof of his mental illness. But syphilis also killed Theo van Gogh soon after Vincent died, suggesting that the afflicted painter took his own life at the prospect of losing his beloved brother, who was also his only friend and patron. Surely one doesn't need bipolar disorder to experience this level of grief and despair. And as it happens, Vincent's suicide has begun to generate its own swirl of controversy, with recent theories about gun accidents and other fingers on the trigger. (For a critical discussion, see Joe Nickell's column, "The 'Murder' of Vincent van Gogh," SI, September/October 2012.)

It should be noted that the symptoms of tertiary syphilis, which raged in many quarters until its 1906 cure, closely mimic the mood swings and psychosis expected of a bipolar diagnosis. A short list of famous victims includes Ludwig van Beethoven, Robert Schumann, Oscar Wilde, and Edgar Allan Poe (Hayden 2003), who have all been trailed by whispers of madness. But it's easy for any artist to acquire a pathological label, since, in addition to soft-pedaling any physical reasons for aberrant behavior, mythers prefer to ignore the crazy-making heartbreak and struggle of the creative life itself. For a fuller discussion of this point, see Chapter 8, "They Must Be Crazy" (Schlesinger 2012, 153–170).

To be fair, fascination with shattered brilliance is hardly new. The parade of the gifted and doomed stretches at least as far back as Icarus, one of the first to be punished for flying too high. Shakespeare's tragic heroes were also inevitably destroyed by their internal flaws (Macbeth's ambition, Hamlet's indecision).Today, the breathless media coverage of every celebrity derailment continues to underscore the danger of great talent, while softening any painful jealousy it evokes in the less-gifted observer. In fact, the myth's capacity to neutralize envy is a major reason for its popularity and endurance.

Another is the contribution of those creatives (and wannabes) who deliberately cultivate a wild, eccentric pose in order to appear more brilliant than they really are and get a pass on such mundane responsibilities as holding up their half of a relationship and paying their share of the rent. Steve Allen, that most un-mad of geniuses, called this ploy "the Bohemian excuse," and its global appeal could well sustain the myth all by itself.

History, in Brief

The mad genius notion benefits from the mystique that clings to virtually every Big Idea from ancient Greece: the conviction that it expresses something profound that "has always been known." The irony is that this one idea began by distorting the original wisdom. For example, Plato invented the concept of "divine madness" to describe a visit from the gods that delivered precious inspiration and enabled the artist to create. This was a fortunate, unpredictable, and short-term event, nothing like the ongoing mental disorder it would become in our time. Over the centuries Aristotle's benign view of melancholia was also twisted to fit the stereotype—often by influential writers who were themselves depressed

and sought to alchemize their own suffering into inherent proof of their superiority.

One such popularizer was the Renaissance monk Marsilio Ficino, whose self-serving translation of ancient texts contained the news that being born under Saturn (as he was) was a sure sign of genius (Wittkower and Wittkower 1963). In 1621, British theologian Robert Burton published *The Anatomy of Melancholy*: 988 pages that helped distract him from his own "distemper." In his rambling and wildly popular tome, Burton considered everything from geography to goblins, but the book's most enduring legacy was to cement the connection between the words *melancholy*, *depression*, and *artistic endeavor*. Today the most prolific myther is psychologist Kay Redfield Jamison, who extols such benefits of her own bipolar disorder as "loving more, and being more loved" (Jamison 1995, 217–218). Her scientific claims will be evaluated a bit later.

These waters are further muddied by the ongoing controversy over whether mental illness—including bipolar disorder—exists at all.

The eighteenth century catapulted the mad genius into permanent cultural icon by merging colorful fiction about the tragic, brilliant hero with the noisy creative struggles of real poets like Poe, Shelley, and Byron. In a perfect storm of influence, all this intense literary and psychosocial drama was soon legitimized by a new scientific focus on the exceptional mind. Certainly the European climate was ripe for Charles Darwin's *Origin of Species* (1859), which sketched the contours of natural supremacy and triggered the eugenicist dream of breeding a superior race of humans. But since ambivalence is an integral part of the myth, by century's end early psychiatrists were expounding on the dark side of genius and its common heredity with idiots and criminals.

Primitive as these speculations were, they are still being used to supply the myth with a long "scientific" pedigree. But this only works if the references are kept vague—and so virtually every writer who cites Cesare Lombroso's 1895 book *The Man of Genius* as credible historical background neglects to reveal that he actually described geniuses as "stammering, sexually sterile, pasty-faced vagabonds of inadequate beard" (1895, 5–37, vi).

These waters are further muddied by the ongoing controversy over whether mental illness—including bipolar disorder—exists at all. Ten years ago the American Psychiatric Association was forced to admit that, despite its practitioners' reliance on medical remedies and terminology, not a single one of the "disease" categories collected in their official manual (the DSM) had a known biological basis or sign (American Psychiatric Association 2003). This is still true today, and in fact the newest edition, the DSM-5, has inspired numerous journalistic exposés, passionate public criticism, and unprecedented protests within the guild itself. Even "the nation's shrink"—the director of the National Institute of Mental Health—has slammed the DSM's lack of validity, noting that the United States government's active search for an alternative classification system has been going on for two years and is mandated to continue for eight more (Insel 2013).

Not surprisingly, mythers prefer to disregard such challenges, relying on public confusion about science to make their statements sound impressive. For example, in the past few years, they keep invoking a "proven" genetic link between bipolar disorder and great creativity. Aside from leapfrogging over the increasing doubts about the diagnosis, they are exploiting the widely reported jubilation over the "mapping" of the human genome—as well as the equally common ignorance about what this actually means. The fact is that this fabled guide only identifies the sequencing of protein chains, rather than establishing precise and immutable links between specific genes and any particular behavior or disease. In any case, even if reliable DNA causality is ever established, individual variations in environment and experience will always affect its expression. But this is much too equivocal for those who want the world to believe that the genetic ingredients of creativity and bipolar disorder, as well as the alleged link between them, are all backed by "indisputable scientific evidence" (Schlesinger 2012, 114).

Wobbly Research

In fact, they are not. And future prospects are dim, due to the enormous research obstacle that blocks any empirical inquiry from the start: the lack of universal definitions or measurements for either variable. The presence of creativity can only be inferred from subjective judgments, such as evaluating arbitrary paper-and-pencil tests of its many amorphous and endlessly-debated components. Similarly, since bipolar disorder lacks the tangible clues from blood tests, brain scans, or diseased tissue that a true physical illness would provide, its verdict turns on such slippery criteria as whether its politically-determined, behavioral "symptoms" are "persistent" during a "distinct" period—temporal parameters that are fully as ambiguous as the symptoms themselves. This makes it impossible to reliably identify these two concepts, let alone connect them in any definitive way—an exercise

approximately as futile as trying to nail two cubes of Jell-O together.

What gets served up instead is a stack of mismatched studies that incorporate so many different concepts, designs, instruments, populations, and methodologies that their findings are virtually incompatible. Mythers get around this by claiming the results "all point in the same direction," although this is no surprise when researchers start with the same agenda. In its own hopeful way, the increasingly popular "meta-analysis" approach vaults over such inconvenient disparities by homogenizing them and declaring this to be "scientific." And so the mad genius gets elevated from fallacy to fact.

Methods to the Madness

The mythers derive their pseudoscientific rationale from three primary sources: psychiatrists Nancy Andreasen and Arnold Ludwig and psychologist Jamison, whose 1989 study and 1993 book have become the sacred scrolls of the mad genius movement (for detailed critiques of all three, see Schlesinger 2009, 2012). Much like citing Lombroso's work without quoting his words, many writers repeat the dramatic claims of this trio without divulging how they were derived. After three decades of studying this literature, I suspect that too few people have actually read the originals, assuming that someone earlier in the chain has already done the proper vetting. The result is that the frequent repetition of these references in both the popular and professional literature creates that coveted whiff of scientific legitimacy all by itself.

Andreasen's 1987 study is still called "the groundbreaker." Comparing thirty writers she knew at the Iowa Writers' Workshop with thirty roughly matched individuals in "non-creative" fields like social work and law, she was their sole interviewer and judge, using her own diagnostic protocol that was not printed with the article and was only available upon request. Andreasen's shocking result—that fully 80 percent of her male, white, and middle-aged writers were mood-disordered—was quickly scooped by *Psychology Today* and *Science News* as if it described all writers of every age, race, type, geography, and gender. Even a full generation later, few realize that Andreasen's stunning majority of disturbed writers reflects such a small, homogenous group—and moreover, one living at a retreat that happens to be famous for attracting burned-out professionals. But most damaging, since Andreasen's results failed to reach statistical significance, is that they could never be more than suggestive rather than the supposed "proof" of creative pathology they have since become.

Jamison's 1989 study has had a greater impact with an even weaker methodology; it effectively launched her as the go-to media expert on the mad genius and continues to appear in virtually everything written on the subject, both inside and outside the field. Like Andreasen, the lone interviewer who hand-picked her white, male, and middle-aged acquaintances, Jamison interviewed forty-seven award-winning British playwrights, poets, novelists, biographers, and visual artists to determine the rate of mood disorders among them. Again, she also invented her own diagnostic criteria, uniquely claiming that her subjects' reports of treatment were the most stringent index of their disorder. But the fatal flaw was her lack of a control group, which precluded any of the customary statistical analyses and left her with only simple percentages to report.

This would seem to end the matter right there. Yet some of those percentages are so impressive that they continue to trump the study's lack of validity. For instance, her 50 percent rate of mental illness among poets seems to confirm the common perception that theirs is an especially perilous art—unless you read the article for yourself and learn that this number only represents a total of *nine* people. Equally obscure is the fact that the hefty 12.5 percent of visual artists taking antidepressants actually reflects only *one* person.

It doesn't help that the original article is so difficult to find. Although it appeared in something called *Psychiatry*, that journal is not one of the prestigious, peer-reviewed journals of similar title that can be searched through the customary professional databases. Rather, this *Psychiatry* is the interdisciplinary newsletter of a non-degree-granting therapy school in Washington, D.C. My copy took some determined off-track digging to find, requiring waiting several weeks and paying a $27 fee to a retrieval service that seems to have since disappeared (it's interesting that Jamison's current online CV lists 126 articles, and this is

The result of writers parroting the "mad genius" myth is that the frequent repetition of these references in both the popular and professional literature creates that coveted whiff of scientific legitimacy all by itself.

the only one that omits naming the publication). Such hurdles can easily encourage busy researchers (and cash-strapped grad students) to simply trust their colleagues' verdict and pass along the news without examining the content themselves.

The third major resource is Arnold Ludwig's book, *The Price of Greatness: Resolving the Creativity and Madness Controversy* (1995), which actually does nothing of the sort. But the title has apparently convinced researchers that there's no need to go any further, since—once again—writers are far more likely to acknowledge the work than to describe it.

Ludwig's method was to gather 1,004 *New York Times* biographies of eminent people from different fields (96 percent of them white), as if they were all shaped by the same ingredients of success. To justify bundling together such dissimilar luminaries as Amelia Earhart, Harry Houdini, and Marvin Gaye, Ludwig invented a number of common explanatory variables like "oddness" and "anger at mother." Despite the fact that these are neither defined nor measurable, they appear in the fifty-five pages of charts and graphs that reassure the reader that something scientific has occurred. Ironically, although Ludwig admits that "mental illness is not essential for artistic success" (1995, 7), his work—or at least its combination of titles—is regularly used to argue the opposite.

A final truth-twisting technique is the "psychological autopsy," in which mythers comb the histories of long-dead geniuses for "evidence" that they were bipolar, even though the verdict is implicit in their choice of whose lives to examine in the first place. Any surviving diaries and letters are scrutinized for signs of delight and disappointment, since finding both is the bipolar jackpot. Autopsists will also dissect other people's writings for concerns about the artist's state of mind. These become additional "data" despite the clear possibility of personal agendas or simple gossip—i.e., that the target's correspondents are doing an early version of Tweeting and for similar motives: to alleviate boredom and stir things up.

Yet hearsay and rumor can easily qualify any artist for the mad genius list, the most popular of which is Jamison's collection of 166 (1993, Appendix A). Although to her credit she softens her diagnoses with the word *probable*, that word tends to fall off whenever her selections are cited. It doesn't help that she has also produced several concerts to "honor" supposedly bipolar composers by exhibiting musical "evidence" of their pathology. In the first of these, in 1989, the National Symphony played composers' happy and sad compositions together to demonstrate their aberrant fluctuations of mood (for a full discussion of this video, see Schlesinger 2012, 106–109).

Ultimately, all this diagnosing of the long-dead seems pointless as well as mean-spirited. As every clinician knows, it can be tricky enough to evaluate someone who is sitting right in front of you; in fact, the difficulty of getting clinicians to agree on a diagnosis is an ongoing and familiar problem, and the main reason that the DSM criteria keep shifting around. What is less well-known is the fact that such remote assessment is actually unethical, since psychiatry's own Goldwater Rule prohibits the public diagnosis of any individual without benefit of a face-to-face interview. But few people know or care about all this.

In the end, the mad genius myth is far too popular to give up—it's old and glamorous and shimmers with a pseudoscientific patina. Besides, the currency of psychology has always been abstraction: aside from neuroscientists who directly examine the brain, hypotheticals may be the best it can offer. This would be fine if it enabled people to accept and appreciate the differences among us, whether in temperament or accomplishment or anything else. The problems arise when such variations are pathologized without proof, diminishing the bright stars who bring such joy and beauty to the rest of us. ■

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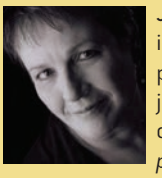

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How News about ESP Research Shapes Audience Beliefs

A study shows that the media can affect beliefs about whether ESP exists and whether ESP researchers are scientific. However, media influence depends on *how* coverage presents ESP research.

PAUL R. BREWER

Controversy erupted in January 2011 when the prestigious *Journal of Personality and Social Psychology* (JPSP) published an article by Daryl Bem, an emeritus professor of psychology at Cornell University, in which he presented a case for ESP (extrasensory perception). Bem (2011a) argued that his experiments showed scientific evidence of precognition, or awareness of future events. However, many other psychologists disputed his conclusions. Indeed, the same journal that published his study also published a rebuttal challenging how he interpreted his data (Wagenmakers et al. 2011). The debate over ESP played out in the pages of the Skeptical Inquirer as well, where James Alcock (2011) presented a critique of Bem's research and Bem himself (2011b) defended it.

Very recently *JPSP* published a study failing to replicate Bem's results (Galak et al. 2012; see Skeptical Inquirer, March/April 2013, for a news summary).

Unlike most psychological studies—even ones published in leading journals—Bem's ESP research became news. Television programs such as *ABC World News with Diane Sawyer* and CBS's *The Early Show* covered it, as did print sources ranging from the *New York Times* to *Discover Magazine*. Some media stories presented Bem's conclusions in a largely one-sided manner, saying little about his critics' objections. For example, a January 23, 2011, interview of Bem on MSNBC allowed him to present his case without rebuttal. Other stories described his research but also gave time to scientific counter-arguments. Still other media stories essentially treated Bem's research as a joke. Most entertainingly, perhaps, comedian Stephen Colbert devoted a January 27, 2011, segment of his satirical television program (*The Colbert Report*) to poking fun at it, saying, "I know what you're thinking: 'Stephen, that's bullshit.' But on the other hand, I *know* you're thinking, 'Stephen, that's bullshit' " (Bem, evidently a good sport, appeared as a guest on the same episode).

All of this raises questions about the potential for media coverage of ESP research to influence audience beliefs. Can media stories sway whether people believe in ESP and whether they see research on it as scientific? Do such effects depend on whether the media cover ESP research in a one-sided way that only presents the case for ESP, a two-sided way that includes scientific rebuttals from ESP skeptics, or a facetious way that treats it as a joke? More broadly, what role(s) can media messages play in fostering belief or skepticism about paranormal research? To help provide answers, I conducted an experiment of my own.

Belief and Media Messages about the Paranormal

Scientific polling shows that many Americans believe in ESP. For example, 41 percent of the respondents in a June 6–8, 2005, Gallup poll said that they believed in it, making ESP the most widely accepted paranormal phenomenon mentioned in the survey (Moore 2005). An even greater percentage (48 percent) of respondents in an October 16–18, 2007, Associated Press-Ipsos poll said they believed in ESP (Bolton

Research suggests that media messages could contribute to the widespread belief in ESP.

2007). In each poll, respondents with a college degree were just as (if not more) likely to believe as were less educated respondents.

Research suggests that media messages could contribute to the widespread belief in ESP. One previous report in the Skeptical Inquirer showed that trends in public beliefs about alien abductions and psychic powers have paralleled trends in news media attention to these topics (Nisbet 2006). Another Skeptical Inquirer article described a series of controlled experiments demonstrating that various forms of media—including "reality" shows, newspapers, and television news—can influence audience members' beliefs about paranormal phenomena ranging from "astral-projection" to UFOs (Sparks 1998). In my own previous research, I conducted an experiment showing that newspaper stories about paranormal investigators can influence readers' beliefs about whether ghosts exist and whether ghost hunters are scientific (Brewer 2012). Taken together, these studies also indicate that the impact of a specific media message on paranormal beliefs can depend on whether it cites a scientific authority as well as whether it is one-sided (only presenting the case for the paranormal) or two-sided (presenting the case against as well).

However, so far no study has directly tested whether media messages can influence beliefs about ESP and its researchers. Furthermore, the existing research on two-sided messages has focused on whether scientific rebuttals can induce greater skepticism about the paranormal; it has not considered the potential effects of media messages that discuss paranormal research but treat it in a humorous or lighthearted manner. Here, I use news coverage of Bem's ESP research as a case study to examine the impact of media messages that challenge paranormal research through either scientific argument *or* dismissive humor.

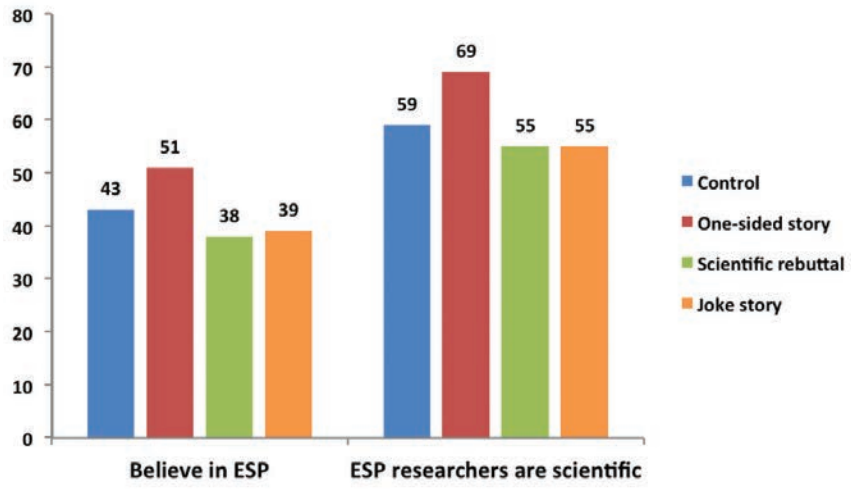

Figure 1. Percentage of experimental participants in each condition who reported believing in ESP and thinking ESP researchers are "very" or "somewhat" scientific.

The Experiment

To do so, I conducted a controlled experiment in April 2012. A team of students helped design the study and recruited 446 fellow students to participate in it.[1] To be sure, college students are not necessarily representative of the broader public; however, recall that belief in ESP appears to be consistent across different levels of education.

The participants were randomly assigned to one of four conditions. Those in the *one-sided story* condition read a news story, attributed to the *New York Times*, that described Bem's research without presenting any criticism of it (headline: "Journal to publish paper on ESP"). Participants in the *scientific rebuttal story* condition read a different version of the story that quoted another psychologist (Ray Hyman of the University of Oregon) as being critical of Bem's research and mentioned that efforts to replicate it had failed (headline: "ESP paper expected to outrage psychologists"). Those in the *joke story* condition read yet another version of the story that described Bem's history of performing "Kreskin-style magic acts for students and friends" and quoted the same psychologist (Hyman) as saying, "[Bem's] got a great sense of humor. . .I wouldn't rule out that this is an elaborate joke" (headline: "You might already know this . . ."). Finally, those in the *control* condition read a story on an unrelated topic. To enhance the realism of the study, we drew the headlines and story contents from real coverage. Afterward, participants completed a survey asking them whether

they believed or disbelieved in ESP as well as how scientific they thought ESP researchers generally are.[2]

Results

Given that the study used random assignment to experimental conditions, one can compare the results across conditions to reach conclusions about whether the different versions of the ESP story influenced readers. First, consider the results among the participants in the control condition. Of these, 43 percent said they believed in ESP and 59 percent saw ESP researchers as "somewhat" or "very" scientific (see Figure 1)—a set of results that, in and of itself, reflects the widespread belief in ESP even among the educated. Now consider the results among participants who read the one-sided story about Bem's research. Of these, 51 percent believed in ESP and fully 69 percent saw ESP researchers as scientific. Thus, reading the one-sided version of the story led to a sizable—and statistically meaningful—*increase* in perceptions of ESP researchers as scientific, as well as a smaller (non-statistically significant) increase in ESP belief.[3]

Meanwhile, reading either the scientific rebuttal story or the joke story led to *decreased* belief in ESP and *decreased* perceptions of ESP researchers as scientific (again, see Figure 1). Of the participants who read the scientific rebuttal story, only 38 percent believed in ESP and only 55 percent saw ESP researchers as scientific. The results were virtually identical for participants who read the joke story: 39 percent of them believed in ESP and 55 percent saw ESP researchers as scientific. All of these percentages were significantly smaller than the corresponding percentages for readers of the one-sided story.

Implications for Education

Many skeptics worry that the media help foster belief in the paranormal and perceptions of paranormal research as scientific (Nisbet 2006; Hill 2012). In part, the findings here reinforce those concerns by showing that uncritical coverage of Bem's study increased perceptions of ESP research as scientific. At the same time, the results show that news coverage citing skeptics or taking a facetious tone can undermine the aura of scientific authority surrounding ESP research. In broader terms, my findings highlight both the power of the media to shape beliefs about the paranormal and the way in which that influence depends on the nature of the coverage. Journalists' choices about *how* to present paranormal research can determine whether their stories encourage faith or doubts about such research.

The findings also carry implications for those seeking to promote skepticism about the paranormal. Bem's critics had the opportunity to follow two different but equally effective paths in responding to his conclusions: by presenting serious counter-claims or by addressing them in a light-hearted way. In an era when the critical satire of comedians such as Stephen Colbert, Jon Stewart, and Penn Jillette increasingly shares the media spotlight with traditional science programming and news, scientific argument and humor may each play important roles in challenging potentially dubious claims of scientific knowledge. ■

Notes

1. The students who helped conduct the study were Jordan Blackbird, Danielle Brody, Kyle Christie, Kerrin Dougherty, Kira Frank, Caitlyn Goodhue, Kylee Harris, Hanna Kim, Jessica Klein, Juliana Liscio, Chelsey Rodowicz, Stephanie Trader, and Nicole Vandevliet.

2. To disguise the true purpose of the study, we asked each participant to read two additional stories on other topics. To further disguise the purpose of the study, the post-test survey included numerous questions on a variety of other subjects.

3. I analyzed the mean (average) responses for each question to test whether they differed across conditions to a statistically meaningful extent, using one-tailed hypotheses tests and a threshold of $p \leq .05$. Scores for belief in ESP ranged on a six-point scale from strongly disbelieve to strongly believe, while scores for perceptions of ESP researchers as scientific ranged on a four-point scale from not at all to very.

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Lost Lessons of the Strangling Angel

Europe's diphtheria outbreaks in the 1940s provide a sobering context for modern anti-vaccination claims.

LaRAE MEADOWS

When the Strangling Angel was at her strongest in Norway and Germany, 715 people each day were infected. She took refuge in the throats and hearts of the unprepared. The Strangling Angel—diphtheria—found comfort on the boots of German soldiers as they marched across Europe in the 1940s. Even though she visited over one million people in Europe at the time, she was forgotten and her lessons were lost.

The merciless lessons of diphtheria are drowned out today by the echo chamber of anti-vaccine activists trying to convince parents not to vaccinate their children and to discourage people from vaccinating themselves. An online collection of factoids meant to support the anti-vaccination position reverberates around the Internet, cut from one website and pasted onto another without fact checking or context. Two of these anti-vaccination echoes are: "In Germany, compulsory mass vaccination against diphtheria commenced in 1940 and by 1945 diphtheria cases were up from 40,000 to 250,000" (Allen 1985), and its usual sidekick, "In nearby Norway, which refused vaccinations, there were 50 cases of diphtheria."

The truth about the relationship between diphtheria and vaccines in the 1940s cannot be expressed as a shout against hard walls while standing at the bottom of a canyon. A higher vantage point is needed to see the truth about vaccines in Europe in the 1940s.

Diphtheria 101

Most industrialized westerners are blissfully ignorant of diphtheria today. To understand how it spread across Europe, we must first understand the basics of the disease.

Diphtheria is a highly contagious bacterial disease of two types: respiratory and skin (cutaneous). Skin diphtheria can cause redness, sores, and ulcers. Mild fever, sore throat, and chills are the first symptoms of respiratory diphtheria. Diphtheria then creates a toxin that makes a blue or gray-green coating that sticks to the throat and nose. The coating thickens in the throat, making it hard to swallow and robbing the patient of breath. Some patients' necks swell, sometimes to the width of the head, a condition called Bull Neck. The toxin can also travel to the nervous system, causing paralysis, and to the heart causing heart failure. Diphtheria was once called the "Strangling Angel" because of how it kills.

The bacteria that cause diphtheria reside in the upper respiratory system. It is spread by close contact with an infected person or contact with droplets of saliva, the toxin, or other bodily fluids. Occasionally objects soiled by an infected person can spread the disease. Susceptibility increases in overcrowded, unsanitary, and poor socioeconomic conditions. Research also indicates that stress and starvation make a person more likely to contract diphtheria. Between 5 and 20 percent of people who get diphtheria die, depending on age. Children are at the highest risk of death.

Diphtheria was a scourge on Europe's residents during World War II. Europe saw more than one million recorded diphtheria cases in 1943, not counting Russia (Stowman 1945).

"Don't Get Stuck"

Don't Get Stuck! asserts: "Vaccination was made compulsory [in Germany] at the beginning of the Second World War; and the diphtheria rate soared up to 150,000 cases, while in unvaccinated Norway, there were only 50 cases" (Allen 1985). Allen offers no sources for this information. Allen is the past president of the natural medicine advocacy group American Natural Hygiene Society.

Hard Numbers

In 1945, the United Nations Relief and Rehabilitation Administration[1] released diphtheria numbers for several European countries over several years, including Norway and Germany (UNRRA 1945).

- In 1940, Germany had 143,585 cases and Norway had 149.
- In 1943 (the last year in the report), Germany had 238,409 cases and Norway had 22,787.

Allen's numbers are reflective of only about one-third of the total cases recorded in Norway and Germany.

Diphtheria's Dark History

In the 1920s and 1930s, diphtheria killed thousands of people every year in Europe, but not all countries were equally affected (Rosen 1948). Diphtheria was one of the top three killers of people under age fifteen in England and Wales in the 1930s. Germany wrestled with exponential increases in diphtheria infection rates between 1920 and 1940 from about 50 to over 200 per 100,000 people (Baten and Wagner 2003). Norway escaped being ravaged by diphtheria and had a long-term steady decline in the numbers of diphtheria cases.

Due to the small number of cases in Norway, no national program for diphtheria vaccinations was instated. Epidemiologists of the time described Norway as almost completely non-immunized (Anderson 1947).

Allen's claims do not include other European countries, but England is essential to note. England implemented a mass diphtheria vaccination program in 1940 in response to the outbreaks. The value of vaccines was made clear to the public. In 1940, England had 47,683 cases of diphtheria and in 1944, the number had dramatically dropped to 29,446 (UNRRA 1945).

Germany did not follow England's lead, but neither did it go the way of Norway. In 1945, Dr. G. Stuart of the European Regional office of the United Nations Relief and Rehabilitation Administration summarized the German vaccine program:

> The reason underlying the high morbidity in Germany and its incorporated territories is largely determined by the absence of any nation-wide policy of immunization comparable to that so successfully applied in Great Britain. On the other hand, a large-scale campaign was introduced in the pre-war period in Western Germany, while an increase in diphtheria morbidity and mortality has since led the Reich and Prussian Ministry of the Interior to approve immunization in those parts of Germany particularly affected. Moreover, immunization is compulsory for all youths at the beginning of their Landjahr—i.e., their year of agricultural service. (Stuart 1945)

(Landjahr was a voluntary program for all youngsters except university students, who were required to participate.)

Germany had an incomplete, non-compulsory diphtheria vaccination program. A large percentage of, maybe even most, citizens were not vaccinated against diphtheria. Even though the original claim and Allen's claim have been fully discredited, the numbers have not yet been put in appropriate context to shed light on the larger issue of vaccine effectiveness. We need to understand why Germany and Norway's numbers went up at such a high rate.

There are two obvious factors that have yet gone unexplored: World War II and the Holocaust.

Sardines and Sanitation

In September 1935, Germany passed the Nuremburg Laws, depriving Jews of many of the rights and protections of citizenship. In October 1935, the laws were extended to cover Roma (gypsies), blacks, and other "undesirables." Between 1933 and 1939, new laws banned Jews from municipal hospitals, forced them out of schools at all levels, and severely limited Jewish doctors' ability to practice medicine. This is not a comprehensive list, but it does demonstrate how restricted health care was for Jewish and other "undesirable" Germans.

In October 1939, the German-occupied territory of Piotrków Trybunalski in Poland opened the first ghetto specifically for Jews. Also in 1939, Germany greatly expanded its use of concentration camps. The number of people held in concentration camps quadrupled from 1939 to 1942. Undesirables from all over Europe—Jews, the mentally ill, Roma, communists, gay people, political dissidents—were also imprisoned in the camps. The estimated number of camps ranges greatly, some estimate up to 15,000 by the end of the war. Some were temporary, others existed for several years.

(There were several different types of concentration camps, including labor camps and extermination or death camps. For the purposes of examining diphtheria in Germany during this time, the specific type of camp is not important, so all the different types of camps will be referred to as concentration camps.)

England implemented a mass diphtheria vaccination program in 1940 in response to the outbreaks. The value of vaccines was made clear to the public.

The Nazis packed people into concentration camps at an even higher rate than they did in the ghettos and further restricted access to clothes, shoes, soap, food, medicine, and clean water. Many camps used prisoners for slave labor. The clothing was inadequate to protect from the cold. Camp prisoners had to contend with starvation, unending stress, exhaustion, and exposure. From a germ's point of view, it was a perfect place to reproduce. Unrelenting tidal waves of disease swept through the camps without conscience or mercy.

"Quite aside from hard-to-measure traumas such as the drawn-out anticipation of an impending catastrophe, the incarceration itself, the dehumaniza-

tion, the sustained fear of death, I could point to some very tangible assaults upon my health in the concentration camp," Jewish linguist Werner Weinberg recalled about his experience in Westerbrock Camp and Bergen-Belsen Concentration Camp. "Among them were prolonged starvation and exposure; being worked beyond my endurance and strength; every cut and bruise turning into festering wounds accompanied by high fever; diphtheria, dysentery, hepatitis, and a bout with typhus that very nearly killed me" (Weinberg 1984).

Bergen-Belsen Concentration Camp was located in northern Germany near Calle. Housed in Bergen-Belsen were Jews, Roma, criminals, Jehovah's Witnesses, homosexuals, prisoners of war, and political prisoners. In July 1944, approximately 7,300 prisoners lived in Bergen-Belsen. By April 1945, the number rose to 60,000. Many of those people were evacuated from other camps or regions in the German occupied territories. Food rations did not rise proportionally.

Bergen-Belsen was liberated on April 15, 1945, by the British Army. The liberators were shocked by what they found: more than 60,000 prisoners in various stages of starvation and almost all suffering from disease.

Lieutenant Colonel M.W. Conin of the Royal Medical Corps at Belsen was one of the first medics from the Allied Forces to enter Bergen-Belsen Concentration Camp. Said Conin, "One had to get used early to the idea that the individual just did not count. One knew that 500 a day were dying and that 500 a day were going to go on dying before anything we could do would have the slightest effect. It was, however, not easy to watch a child choking to death from diphtheria when you knew a tracheotomy and nursing would save it" (Reilly et al. 1997).

From a germ's point of view, the Nazi camps were a perfect place to reproduce. Unrelenting tidal waves of disease swept through the camps without conscience or mercy.

Fear Medicine

Prison block infirmaries and camp hospitals were short of all medical supplies including cots, life-saving drugs, sterile supplies, diagnostic tools, staff, and anesthesia. Prisoners had to share beds even if their diseases were contagious. The block infirmaries were often staffed by other prisoners without medical training, who were left to administer treatment, diagnose problems, and even perform surgery. The infirmary staff would often try to hide advanced illness from Nazi doctors who would come to check on the patients because the Nazi doctors were usually performing "selection." When patients were "selected" it usually meant they were chosen to be put to death. According to numerous accounts, prisoners resisted going to the camp doctors. The infirmaries were called "waiting rooms for the crematoria" in some camps.

Just an Experiment

In some camps prisoners were subjected to deadly medical experiments, including new vaccine development. Research on typhus, smallpox, cholera, malaria, yellow fever, tuberculosis, paratyphoid, and diphtheria was conducted on the prisoners.

In written testimony given for the International Auschwitz Committee, former prisoner Dr. Stanislaw Klodzinski described the medical experiments he saw performed by SS doctors and pharmaceutical company representatives: "These preparations, he tried out on prisoners of the Auschwitz camp for experimental purpose regarding typhus, typhoid fever, and various para-typhoid diseases, diarrhoea [*sic*], tuberculosis of the lungs, erysipelas, scarlet fever and other diseases" (International Auschwitz Committee 1986).

When disease levels got too low in the camps where research was taking place, Nazi doctors intentionally injected prisoners with disease and sent them out into the populations at the camps to re-infect the prisoners and keep diseases active in the camps. By having a lasting infection, they could study the effectiveness of vaccines as well as the long-term effects of the diseases (Baumslag 2005, 145).

War

Lieutenant William Smith of the Canadian Army explains death on the front in World War II in his online account of Operation Infatuate (an amphibious landing to take Walcheren, a Dutch Island). "There in early December, outside Groesbeek, on the

edge of the Reichswald Forest, I was wounded on patrol. Brown was killed, shot in the kidneys by a sniper, and Doakes died of diphtheria in a hospital somewhere in Holland" (Smith 1944).

Smith's story was common. Soldiers killed each other; diphtheria and other diseases killed soldiers. Soldiers, especially those on the front lines and in prisoner of war (POW) camps, underfed, under-dressed, packed together in tight groups and exhausted, were vulnerable to disease. Every aspect of war made the soldiers and civilians more vulnerable to disease.

Capture

Conditions for POWs during World War II varied depending on rank, circumstance, and the country in which they were captured. In Germany, some POWs were kept in castles, others were forced to work as slave laborers. Many lived in concentration camps or in conditions similar to them.

In January 1945, tens of thousands (numbers vary between 30,000–120,000) malnourished Allied prisoners of war were forced to march in groups of up to 300 across Poland and Germany in what came to be known as The Long March. Temperatures dipped to a biting -13 degrees Fahrenheit. The prisoners were given inadequate water and food. They had to resort to drinking from ditches and scavenging for food, including eating rats. They were forced to sleep on the ground in the freezing conditions, which resulted in amputations due to frostbite. POWs died from exposure, dysentery, exhaustion, pneumonia, typhus, and diphtheria. Between 1,121 and 2,200 POWs died during the three-month winter march.

Diphtheria on the March

Germany's policy of slave labor, concentration camps, ghettos, and a lack of vaccines made it a festering pustule of disease. As Germany marched across Europe, disease became a second army, a wake of death behind the tanks and guns.

The European countries with the greatest increases in diphtheria during 1940–1944 were Norway, Belgium, the Netherlands, France, and Denmark. The Netherlands saw a whopping forty-fold increase in diphtheria cases, which was dwarfed by Norway's 112-fold increase in cases (Stuart 1945). The increases in diphtheria rates all followed the German occupations in those countries. Germany's official numbers did not even double (UNRRA 1945).

Belgium was invaded by Germany in May 1940, and with the invaders came a considerable increase in diphtheria.

Norway's decision to have an unvaccinated populace was a deadly mistake.

In 1939, Belgium had 2,419 cases of diphtheria. By 1941, the number had skyrocketed to 4,271. Even worse was 1943 at 16,072 or about 1,340 cases per month (UNRRA 1945). In September 1944, the Canadians pushed into Belgium and started to shove Germany out. In early November, the Germans were forced out of Belgium. In November, the cases were down to 447 (Stuart 1945).

The Netherlands was also invaded by Germany in May 1940. In 1939, they had 1,273 cases of diphtheria. 1940 had a shocking 5,501 cases. The exponential growth continued for the next two years, with 1942 seeing 19,527 and 1943 seeing 56,603. In August 1944 the number of cases was up to 60,226. The Germans were booted from the Netherlands in early 1945. In 1945, diphtheria rates in the Netherlands dropped faster than they gained the year before, to 49,730 cases (Stuart 1945; Anderson 1947; UNRRA 1945).

The Netherlands and Belgium had one significant commonality—incomplete vaccine programs. The Netherlands stopped their previously widespread but not comprehensive diphtheria vaccine program during the war. Belgium attempted widespread vaccinations but did not make it mandatory.

Norway Was Different

Unlike the Netherlands and Belgium, Norway was completely undefended against diphtheria. The rates of diphtheria dipped so low the country had little natural resistance and there was no national or compulsory vaccination program. When Norway was invaded in April of 1940, it set in motion an astronomical spread of diphtheria.

In 1939, Norway had 71 cases of diphtheria. By 1943 it was up to 22,787 (UNRRA 1945). Norway was caught totally unprepared. With no inoculations and no natural immunities, the population was at the mercy of the troop movements and the disease's

course. Norway's decision to have an unvaccinated populace was a deadly mistake.

Lessons Learned

Allen was on to something—diphtheria in Europe during the 1940s is a compelling anecdote in the current debate over the safety and effectiveness of vaccines. Unfortunately for the original online assertion, Allen's position, and the anti-vaccination position, the vaccination programs in Norway and Germany argue in favor of mass, compulsory vaccinations and show the dangers of the anti-vaccination movements to the health of all people.

In countries without complete vaccination programs, when the disease was introduced, it spread at an almost inconceivable rate. Norway's mistake—be it a result of hubris or ignorance—was its belief it could control a disease without vaccines and its failure to adequately consider changing conditions outside its control.

Europe in the 1940s is a case study that demonstrates the importance of paying attention to the health of all countries and helping them eradicate their diseases. The world is a smaller place than it was during WWII. All people are just a short plane ride from the next continent. A person infected with diphtheria can take between two to five days to show symptoms. In that time an infected person can travel thousands of miles by plane and potentially contact thousands of people.

Germany and Norway in the 1940s also teach us that human rights abuses are not just matters of morality for the persons directly involved. Altruism is not the only reason to help people in conditions like those in ghettos and camps; enlightened self-interest may be necessary to protect from outbreaks of disease. The take away from World War II Europe diphtheria rates and the effectiveness of vaccines would be most clearly stated as:

In the 1930s and 1940s, Germany created a breeding ground for diphtheria. They did not implement a comprehensive, compulsory vaccine program. They restricted medical care for large sections of the population, and crowded those people into concentration camps and ghettos. That concentration and the accompanying war conditions led to outbreaks of disease in Germany. As a consequence, diphtheria could be found in the footsteps of German soldiers in countries they invaded during World War II. After being invaded by Germany, Norway, which had no diphtheria vaccine program, saw unimaginable increases of diphtheria (149 cases in 1940 to 22,787 in 1943). Other countries with incomplete inoculations, like Belgium, the Netherlands, France, and Denmark also had huge increases. England had an extensive vaccination program and the incidents of diphtheria during World War II declined. Vaccinations are essential to protecting people from disease and merely controlling it by other means is not sufficient.

The anti-vaccination movement in America today uses Hannah Allen's claims about Germany and Norway to try to discourage vaccinations in children and adults. As a result of their efforts, nearly ten percent of children in America are not fully vaccinated. The number of parents filing for exemptions to school vaccine requirements is increasing steadily. America is having outbreaks of diseases previously controlled through vaccinations, like whooping cough and measles. America may soon be as vulnerable as Belgium was in the 1940s. If anti-vaccination proponents see their goal accomplished, America risks becoming another Norway.

Dr. Paul Offit, developer of the rotavirus vaccine, summarized his objection to the anti-vaccination claims about vaccines in 1940s Germany plainly: "I can't believe we are still discussing this in the 21st century. There is no debate. Look at the history of vaccinations in the world and you come away with the following conclusion: immunization rates increase, disease decreases. It is just that simple."

Acknowledgments

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Note

1. United Nations Relief and Rehabilitation Administration was the branch of the United Nations tasked with planning and coordinating relief efforts for WWII war victims.

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LaRae Meadows is bent on investigating important topics, contorting herself to discover new views, and sharing her discoveries. Her dangerous lack of self-preservation makes writing on controversial topics fun for her. She has a background in legislative and policy advocacy for foster children in California and owns a small business.

Electrocuting Parasites: Cutting Edge Pseudoscientific Technology

Want to rid your body of worms and other parasites? Forget the medical doctors and the toxic drugs they prescribe. Just hook yourself up to the "Parasite Zapper," turn it on, and electrocute the nasty little things.

THOMAS PATTERSON

As a guest lecturer in a clinical parasitology course, I came across information about a very unusual device while I was updating my lecture material. The device is called the "parasite zapper." It is a small black box with two copper colored handles or pads. Each handle is connected to the box by a wire. The "patient" holds a handle in each hand while the box is turned on to supposedly rid the body of parasites.

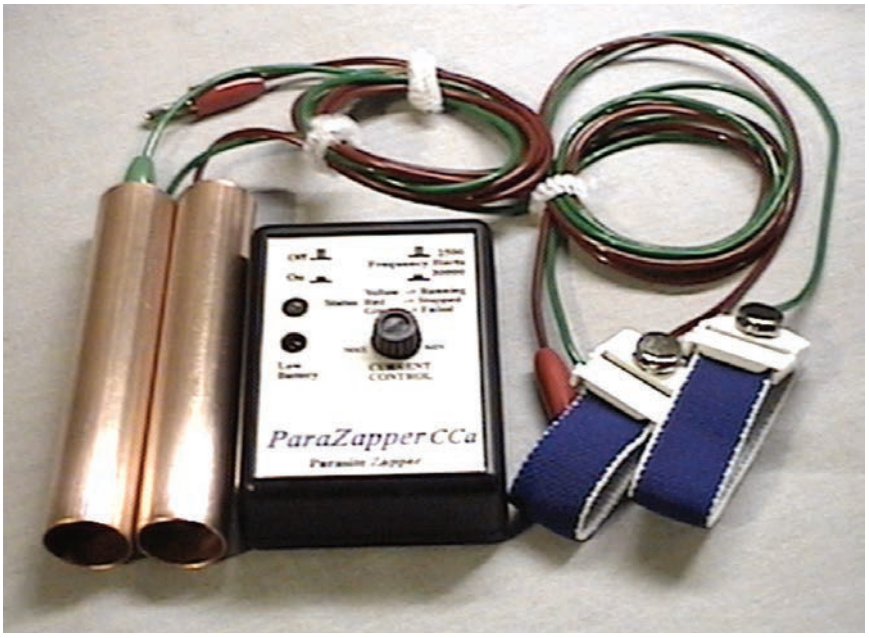
I found this interesting, as I had never heard of such a device for treating parasitic infections. Standard protocol for a suspected parasitic infection is to gather a specimen, carefully identify the parasite in the laboratory, and then prescribe the appropriate anti-parasitic drug. However, this contraption with its tiny nine-volt battery supposedly electrocutes parasites and rids the body of these nasty little critters. No time-consuming medical diagnosis or careful parasite identification is needed with this amazing parasite zapper.

It seems that the zapper is the brainchild of Hulda Clark. Clark earned her PhD in animal physiology from the University of Minnesota. Her doctoral dissertation was on potassium compartments of crayfish, so I am understandably skeptical of her qualifications as a healthcare provider. In addition, she earned a Naturopathic Doctor (ND) degree from the now-defunct Clayton College of Natural Health, an unaccredited complementary medicine correspondence school that ceased operation in 2010. This makes me even more skeptical.

Further investigation revealed that she is also an author and has written several books that are rife with pseudoscience. Her best-known work is probably *The Cure for All Diseases*, in which she reports that all human disease is directly related to parasitic infections or toxins. According to her, if we could rid ourselves of these two curses, almost all diseases would disappear from humanity (Clark 1995, 2). She evidently knows this because she has diagnosed and treated hundreds of patients.

I was not aware that an animal physiologist could obtain a license to treat human patients. I was aware that the title "doctor" does not necessarily mean "medical doctor." Evidently the state of Indiana was aware of this also; in 1993 Clark caught wind of an investigation of her practice by the State of Indiana and quickly left the state. She later moved her healthcare operation to Mexico, where she operated a clinic called Century Nutrition.

The claims in her book border on the bizarre. Clark states that she has



discovered though her unpublished "experiments" that each living organism gives off its own frequency like a very tiny radio station. For example, the herpes simplex virus gives off a frequency of 300 KHz while a salmonella bacterium transmits at 400 KHz (Clark 1995, 18). By offsetting these frequencies (whatever that means) with her zapper, the microorganisms can be killed. The idea that each virus, bacterium, parasite, or other living organism transmits a species-specific frequency is preposterous.

She also claims that hundreds of human cancers are caused by one parasite, *Faciloposis buski* (Clark 1995, 250). She is convinced that infection with this parasite is also necessary before one can contract HIV (Clark 1995, 150). How she knows this is unclear. A search of the scientific literature reveals no studies that show a connection between this parasite and human cancers or HIV infections.

The fluke *Faciolopsis buski* is leaf shaped and is about two to three inches long. The adult worm lives in the intestine and is sometimes referred to as the giant intestinal fluke. *Fasiolopsis buski* is found in tropical and subtropical parts of China, Thailand, Vietnam, and India. It gains entry into the body when an individual ingests larvae infected water plants like water chestnuts. The larvae are microscopic and cannot be seen with the naked eye (Zeibig 2013, 269). This fluke is uncommon in the United States, but when it is found it is mostly seen in recent immigrants or visitors from the above-mentioned areas.

I have never seen the flatworm *Faciolopsis buski* in a patient. However, I do agree that many Americans are infected with parasites. The most common worm infections I have seen in the Midwest are pinworm (*Enterobius vermicularis*) infections and roundworm (*Ascaris lumbricoides*) infections. Pinworm infections are fairly common in children. Female pinworms crawl out of the anus at night and can cause intense itching, usually the first symptom.

Some roundworms like to leave the intestine and roam about inside and outside the body. It is not unusual for a patient to bring in a roundworm that has crawled out of their nose, as this worm can migrate from the intestine, back into the stomach, and out the mouth or nose. It is also not unusual for a mother to bring in a child's diaper with a few roundworms flailing about in the crotch area of the diaper, much to the mother's horror.

The idea that each virus, bacterium, parasite, or other living organism transmits a species-specific frequency is preposterous.

Most infections are easily treated with antiparasitic drugs. In extremely rare cases, a very heavy roundworm infection can cause intestinal blockage and may require surgery. Standard treatment for roundworms and pinworms consists of a prescription for mebendazole, which is very effective against most intestinal worms (Zeibig 2013, 194). I am not aware of a single documented case in which the parasite zapper has eliminated a true pinworm or roundworm infection.

I would venture to say that the zapper, if it delivers the nine volts of direct current (DC) from the battery, could kill a small parasite under controlled conditions. I have seen my battery-powered electric fly swatter electrocute flies with a sparkling pop. Parasite killing would be a different matter entirely. The parasite would have to be in a mild salt solution in a petri dish with the parasite located between the two terminals of a nine-volt battery.

But if I complete the circuit with the nine volts applied across each of my hands, my body acts like a tremendous resistor and there is not nearly enough voltage to kill parasites in my body. I tested this idea using a fresh nine-volt battery and a voltmeter. There was enough resistance in my body so that nine-volts went in but none came out, according to my voltmeter. Certainly parasites can be killed with a jolt of electricity, but pushing enough voltage or current through the human body to kill parasites would be painful indeed, not to mention the potentially deadly effect of playing havoc with the electrical conduction of the heart. One might opt for the parasite infection rather than near-electrocution.

Some zapper believers state that they have seen first-hand the zapped worms in the toilet. My guess is that they are actually seeing vegetable fibers or undigested food material. First of all, has the believer actually been diagnosed with a parasitic infection? If so, what species of parasite? Can someone be cured of a disease or infection they may not even have? Where is the scientific evidence that the parasite zapper actually kills parasites?

I could find only one study that evaluated the zapper. "Zapper study shows that zappers have benefit" was published in the *American Naturopathic Medical Association Monitor* (Thiel 1998, 5–9). However, this journal is not available on Pub-Med, the online repository for evidence-based biomedical journals and research studies.

The investigator studied subjects with all sorts of "possible" infections that were never verified. The possible infections were: "Strep, Staph, Viral, Fungal, and Parasitic." No laboratory-supported diagnosis was made, as the author was a naturopath and was

not allowed by the State of California to order medical laboratory tests. Infections were identified by symptoms such as gas, bloating, constipation, etc. The outcome he relied on at the end of the study was "how the subject felt after treatment." During the study, the author states that many of the subjects also took a variety of vitamins, herbal blends, and glandular supplements. He did not state what the nutritional supplements were, but he wanted to investigate two variables, the effect of zapping and nutritional intervention on the above-mentioned infections. Investigating the effect of two variables in the same study can be difficult.

It must be noted that at the beginning of the study, no samples were collected from any of the subjects to determine if they even had a parasitic infection or any other type of infection in the first place. Of course, most of the subjects showed noticeable improvement at the end of the study. A predictable outcome if the subject passionately believes that the zapper works. The references cited in the study included many alternative medicine publications including Clark's *The Cure for All Diseases*.

To summarize, this study looked at subjects who had symptoms of gas, bloating, constipation, etc. The subjects took unknown amounts of various nutritional supplements and they felt better after they received a round of zapping. So are we to conclude that zapping and nutritional interventions are beneficial for treating "Strep, Staph, Viral, Fungal, and Parasitic" infections?

To really test the efficacy of the zapper, a large number of individuals would have to be accurately diagnosed with the same parasitic infection. Half would be randomly assigned to a control group and the other half to an experimental group. The control group would be given simulated zapper treatments, that is, the zapper would have no battery in it. The experimental group would be given the actual recommended full zapper treatments. The subjects must not know to which group they belonged. In addition, the person administering the treatments should not know if the real zapper was used or if the fake zapper was used. This is called double blinding and it is designed to minimize bias. Any type of bias can lead to errors in collecting and interpreting data.

Samples must be collected before treatment and after treatment. If parasites were present in the subject's sample before treatment and no parasites were present in a sample collected after treatment, this would strongly suggest that the zapper treatment was effective. By objectively comparing the results of the before and after samples, a statistical calculation can be done to see if any difference observed between the control (untreated) and experimental (treated) groups was significant.

I can find no well-designed scientific studies that demonstrate that the small voltage produced by the zapper electrocutes parasites. Evidently one of the advocates of zapping noticed this also and states on the web that the zapper no longer electrocutes parasites. It actually works by waking up white blood cells that can then attack and eliminate parasites. How he knows this he doesn't say, but he seems convinced.

I have observed thousands upon thousands of white blood cells during my long career in the medical laboratory, but I don't believe I have ever witnessed a sleeping (or even drowsy) one, so I don't know if this is true or not. But no matter how it supposedly works, there is currently no published scientific study that suggests that zapping will kill parasites in the human body either directly or indirectly.

A survey of the Internet suggests that the zapper is very popular, and several models are now available for purchase. Not surprisingly, these websites abound with many wonderful tales and testimonials about the healthful benefits of regular zapping. It evidently works on kids, pets, and even food! One deluxe model comes with a sixteen-inch-square platform that allows the zapper enthusiast to zap fruits and vegetables before eating them. One simply lays the fruits and veggies on the platform, which is connected to the zapper box by a wire. If your dog looks like he or she needs a round of zapping, catch your dog and place the zapper pads on each side of the ribcage and then secure the pads and zapper box in place with a bandage. Your dog will undoubtedly love this and will soon be begging for more zapping sessions. Don't forget the kids.

Of course the zapper is not approved by the FDA for treating any type of infection, perhaps because it is so effective that it would put the pharmaceutical companies and physicians out of business. However, my guess is that it is not approved for treating infections because the whole zapper concept makes no sense and no one can prove that it even works.

The praises of parasite zapping make me wonder about the scientific literacy and the critical thinking skills of the public. In an age of tremendous scientific advances it is a puzzle why so many believe in homeopathy, ear candling, detoxification, magnetic healing, energy wand waving, power balance bracelets, urine drinking, and the host of other illogical and unproven ideas that seem to be so popular today. We should probably add parasite zapping to this list. ■

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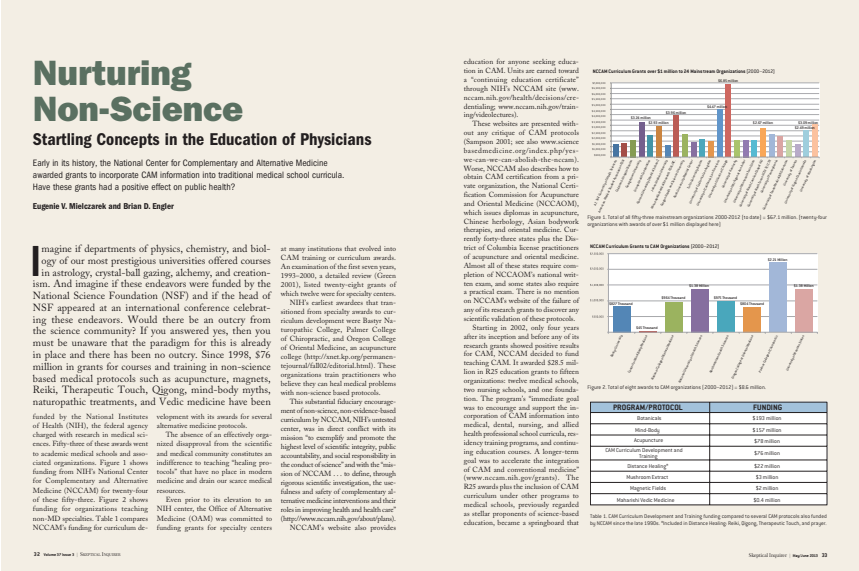
NCCAM Responds to 'Nurturing Non-Science' Article



Nurturing Non-Science

Startling Concepts in the Education of Physicians

Early in its history, the National Center for Complementary and Alternative Medicine awarded grants to incorporate CAM information into traditional medical school curricula. Have these grants had a positive effect on public health?

Eugenie V. Mielczarek and Brian D. Engler

Imagine if departments of physics, chemistry, and biology of our most prestigious universities offered courses in astrology, crystal-ball gazing, alchemy, and creationism. And imagine if these endeavors were funded by the National Science Foundation (NSF) and if the head of NSF appeared at an international conference celebrating these endeavors. Would there be an outcry from the science community? If you answered yes, then you must be unaware that the paradigm for this is already in place and there has been no outcry. Since 1998, $76 million in grants for courses and training in non-science based medical protocols such as acupuncture, magnets, Reiki, Therapeutic Touch, Qigong, mind-body myths, naturopathic treatments, and Vedic medicine have been funded by the National Institutes of Health (NIH), the federal agency charged with research in medical sciences. Fifty-three of these awards went to academic medical schools and associated organizations. Figure 1 shows funding from NIH's National Center for Complementary and Alternative Medicine (NCCAM) for twenty-four of these fifty-three. Figure 2 shows funding for organizations teaching non-MD specialties. Table 1 compares NCCAM's funding for curriculum development with its awards for several alternative medicine protocols.

The absence of an effectively organized disapproval from the scientific and medical community constitutes an indifference to teaching "healing protocols" that have no place in modern medicine and drain our scarce medical resources.

Even prior to its elevation to an NIH center, the Office of Alternative Medicine (OAM) was committed to funding grants for specialty centers at many institutions that evolved into CAM training or curriculum awards. An examination of the first seven years, 1993–2000, a detailed review (Green 2001), listed twenty-eight grants of which twelve were for specialty centers.

NIH's earliest awardees that transitioned from specialty awards to curriculum development were Bastyr Naturopathic College, Palmer College of Chiropractic, and Oregon College of Oriental Medicine, an acupuncture college (http://xnet.kp.org/permanentejournal/fall02/editorial.html). These organizations train practitioners who believe they can heal medical problems with non-science based protocols.

This substantial fiduciary encouragement of non-science, non-evidence-based curriculum by NCCAM, NIH's untested center, was in direct conflict with its mission "to exemplify and promote the highest level of scientific integrity, public accountability, and social responsibility in the conduct of science" and with the "mission of NCCAM . . . to define, through rigorous scientific investigation, the usefulness and safety of complementary alternative medicine interventions and their roles in improving health and health care" (http://www.nccam.nih.gov/about/plans).

NCCAM's website also provides education for anyone seeking education in CAM. Units are earned toward a "continuing education certificate" through NIH's NCCAM site (www.nccam.nih.gov/health/decisions/credentialing; www.nccam.nih.gov/training/videolectures).

These websites are presented without any critique of CAM protocols (Sampson 2001; see also www.sciencebasedmedicine.org/index.php/yes-we-can-we-can-abolish-the-nccam). Worse, NCCAM also describes how to obtain CAM certification from a private organization, the National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM), which issues diplomas in acupuncture, Chinese herbology, Asian bodywork therapies, and oriental medicine. Currently forty-three states plus the District of Columbia license practitioners of acupuncture and oriental medicine. Almost all of these states require completion of NCCAOM's national written exam, and some states also require a practical exam. There is no mention on NCCAM's website of the failure of any of its research grants to discover any scientific validation of these protocols.

Starting in 2002, only four years after its inception and before any of its research grants showed positive results for CAM, NCCAM decided to fund teaching CAM. It awarded $28.5 million in R25 education grants to fifteen organizations: twelve medical schools, two nursing schools, and one foundation. The program's "immediate goal was to encourage and support the incorporation of CAM information into medical, dental, nursing, and allied health professional school curricula, residency training programs, and continuing education courses. A longer-term goal was to accelerate the integration of CAM and conventional medicine" (www.nccam.nih.gov/grants). The R25 awards plus the inclusion of CAM curriculum under other programs to medical schools, previously regarded as stellar proponents of science-based education, became a springboard that

NCCAM Curriculum Grants over $1 million to 24 Mainstream Organizations [2000–2012]

Figure 1. Total of all fifty-three mainstream organizations 2000-2012 (to date) = $67.1 million. [Twenty-four organizations with awards of over $1 million displayed here]

NCCAM Curriculum Grants to CAM Organizations [2000–2012]

Figure 2. Total of eight awards to CAM organizations [2000–2012] = $8.6 million.

PROGRAM/PROTOCOL	FUNDING
Botanicals	$102 million
Mind-Body	$157 million
Acupuncture	$78 million
CAM Curriculum Development and Training	$76 million
Distance Healing*	$22 million
Mushroom Extract	$3 million
Magnetic Fields	$2 million
Maharishi Vedic Medicine	$0.4 million

Table 1. CAM Curriculum Development and Training funding compared to several CAM protocols also funded by NCCAM since the late 1990s. *Included in Distance Healing: Reiki, Qigong, Therapeutic Touch, and prayer.

Thank you for your letter to Dr. Francis Collins, Director, National Institutes of Health, regarding the May/June 2013 issue of the Skeptical Inquirer, specifically the article "Nurturing Non-Science: Startling Concepts in the Education of Physicians." As the National Center for Complementary and Alternative Medicine (NCCAM) was the subject of the article, your letter was forwarded to us for reply.

NCCAM's mission is to define, through rigorous scientific investigation, the usefulness and safety of complementary and alternative medicine (CAM) interventions, and their roles in improving health and health care.

Unfortunately, the article contains several errors. We appreciate the opportunity to address some of the most important issues we identified.

The first issue is regarding the stated purpose of the education program discussed in the article. NCCAM has supported two curriculum programs under the "R25" mechanism. The first, funded from 2000 to 2006, provided grants to mainstream educational institutions and organizations. The program was designed to expose conventional practitioners to the state of the scientific evidence about CAM therapies during their training, with a goal of improving communication with, advice for, and care of their patients. The program sought to address the concern that physicians and other health care practitioners had relatively little reliable training or objective scientific information about CAM therapies, even though approximately 40 percent of adult patients were employing these practices (http://grants.nih.gov/grants/guide/pa-files/PAR-00-027.html). The intent of the program was not to train students about how to practice CAM modalities, as the authors assert. A special issue of *Academic Medicine* (October 2007) describes the program, and lessons learned, in detail.

The other educational program (http://grants.nih.gov/grants/guide/pa-files/PAR-04-097.html), which is ongoing, is limited to professional schools that train complementary health practitioners, including schools of osteopathic medicine, chiropractic, and oriental medicine. It explicitly *includes* mainstream professional schools. The goal of this program is "to increase the quality of the research content in the curricula at CAM institution in the United States where CAM practitioners are trained . . . to enhance CAM practitioners' exposure to, understanding of, and appreciation of the evidenced-based biomedical research literature and approaches to advancing scientific knowledge." Again, neither of these programs was designed to provide training in the practice of CAM modalities.

The second issue concerns the expenditures and number of grant awards cited in the article. NCCAM has funded or administered a total of twenty-five discrete R25 grants from its inception through the fiscal year 2012, with a total value of approximately $33 million (this includes approximately $23 million awarded to fifteen institutions under the first program and approximately $10 million under the second). The authors inaccurately state that the cost of these education grants was $76 million and that there were as many as fifty-three awards. In addition, some of the grantee institutions shown in figure 1 of the article, such as the University of Virginia Charlottesville and the University of Illinois at Chicago, did not receive NCCAM curriculum grants with data exported from NIH RePORTER and a description of the search criteria used.

The third issue is regarding our consumer publication on credentialing

of CAM providers, referenced in the article (http://nccam.nih.gov/health / decisions/credentialing.htm). This is an informational piece designed to help members of the general public understand the lack of national standards and enormous state-to-state variation in credentialing and licensure of CAM professions across the United States. This is the central theme of the fact sheet. Contrary to the authors' implications, this piece does not describe how to obtain CAM certification, nor can one earn CEU's by accessing this fact sheet.

Finally, NCCAM is committed to the dissemination of its research results through multiple channels. NCCAM-funded research has resulted in more than 3,000 peer-reviewed publications, including prominent studies published in leading journals such as the *New York England Journal of Medicine* and the *Journal of American Medical Association.* Although the authors claim that our website does not mention any negative research findings, the NCCAM website has numerous summaries of publications from many of these papers showing both positive and negative results (http://nccam.nih.gov/research/results) as well as important safety information (http://nccam.nih.gov/health/safety).

These are a few of the most important concerns we noted in reading this article. While we welcome critical reviews of our initiatives, based on the nature of inaccuracies, we have respectfully requested that this article be retracted. If I can be of any further assistance, please feel free to contact me.

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Authors Reply to NCCAM Response

Our response to Alyssa Cotler of NCCAM is arranged consecutively covering each issue raised.

First Issue: "Stated purpose of education programs discussed in the article."

The PAR-00-027, released December 13, 1999, established the first R25 grants (http://grants.nih.gov/grants/guide/pa-files/PAR-00-027.html) and the intent is clear. Appearing in the section on Educational Objectives is this sentence: "The intent of this initiative is to help support the incorporation and integration of CAM information into the educational curriculum to which conventional medical, dental, nursing, and allied health professional students are exposed and into the CE for conventional practitioners."

The authors were aware of and have read the special issue of *Academic Medicine* of October 2007. It is from one article there by Pearson and Chesney (http://journals.lww.com/academicmedicine/Fulltext/2007/10000/The_CAM_Education_Program_of_the_National_Center.3.aspx) that the substance of our quote stems. The NCCAM link included in the paper does not make this explicit. However, our references include a later paper published also in *Academic Medicine* (Marcus, Donald, and Laurence McCullough 2009). An evaluation of the evidence in "evidence-based" integrative medicine programs, *Academic Medicine* 84(9): 1229–34. The Marcus and McCullough paper clearly evaluated the installation of courses on non-evidenced based protocols into physician education.

Second Issue: ". . . concerns expenditures and number of grant awards cited . . ."

Cotler's letter addresses only programs supported under the R25 mechanism. Our paper addressed all grants that featured curricula and training. As we stated in our article: "From 2000–2012, the total sum of awards falling under the mantle of CAM pedagogy to both mainstream and CAM schools was $76 million." These include R25 but also other grant mechanisms. This fact is stated explicitly in a number of places and resulted in the $76 million total cited. NIH Reporter was used in our research. Indeed, having examined all NCCAM grants for an earlier article, we started our work on this paper by dividing the R25 grants from other mechanisms that at first glance seemed not to involve education or training curricula. As our detailed investigation continued, though, we soon discovered that the boundary between curricular and non-curricular grants was not as rigid as Cotler implies. We realized that the R25 grants represented only about half of those that we needed to consider in examining the impact of NCCAM funding on health professionals' education. So we expanded our investigation as addressed in our article.

Cotler specifically calls out two mainstream institutions as some that did not receive R25 grants: University of Virginia Charlottesville and University of Illinois Chicago. She is correct as far as that funding mechanism goes, but this objection is beside the point. As stated previously, our study went beyond R25 grants alone by finding

and including other grants that also involved the establishment of or changes in course, training, and university curricula.

UVA, for example, included a series of K30 and a T32 grants (totaling $2.5 million). A K30 grant is defined by NIH as a "Clinical Research Curriculum Award." A T32 grant is a "National Research Service Award." The specific grants we included are briefly described below:

A series of K30 grants, active between 2001 and 2005, entitled "CAM CLINICAL RESEARCH CURRICULUM PROGRAM" (http://projectreporter.nih.gov/pr_Prj_info_desc_dtls.cfm?aid=6224293&print=yes). Its description states that the effort was to "support an interdisciplinary effort between the schools of medicine and nursing at the University of Virginia and the Center for the Study of Complementary and Alternative Therapies (CSCAT)." Further, it was dedicated to "the expansion and improvement of core courses designed as in-depth instruction in the fundamental skills, methodology, theories and conceptualizations needed for the well-trained, independent CAM clinical researcher." While we do not question the need for well-trained medical researchers, we asked what might be different in the education of a "CAM clinical researcher" as compared to any other—perhaps CAM methodologies themselves? Very likely so, since the grant description goes on to state, "The faculty includes credentialed CAM practitioners." In any case, it was clear to the authors that such grants, even though they were not funded via the R25 mechanism, fit squarely into the set of grants that seem to be pushing unproven pseudoscience into mainstream health curricula.

UVA also received a series of T32 grants, active between 2007 and 2011, entitled "TRAINING PROGRAM IN COMPLEMENTARY & ALTERNATIVE MEDICINE" (http://projectreporter.nih.gov/pr_Prj_info_desc_dtls.cfm?aid=7066159&print=yes). This program, too, aimed at producing CAM researchers and explicitly calls out coursework to be provided including "evidence-based complementary practices and products" for Post-Docs and "coursework and experiential exercises in complementary practices and products," "two CAM-specific application development courses," and "a CAM-related dissertation" for pre-doctoral trainees. Again, it was clear that, though not R25, these grants also belonged in our study.

Our concern remains that millions of U.S. taxpayers' dollars have been and are being expended by NCCAM on research into CAM modalities that, long ago, have been shown to be ineffective—sometimes by other government agencies.

The grants we included for UI Chicago were funded by the K07 ("Academic/Teacher Award") and P50 ("Specialized Center") mechanisms and totaled $6.8 Million. Project descriptions may be found online at http://projectreporter.nih.gov/pr_Prj_info_desc_dtls.cfm?aid=7318080&print=yes and at http://projectreporter.nih.gov/pr_Prj_info_desc_dtls.cfm?aid=6171951&print=yes, respectively. In the former, between 2008 and 2012 the PI was to "take on the tasks of developing curricula in natural products pharmacology." The latter, active between 2001 and 2004, included three "cores," one of which is described as follows: "The Education and Information Core will be responsible for pharmacognosy curriculum development and the implementation of graduate and post-doctoral training programs, for the implementation of interactive online learning and continuing education programs, phone-in services for the public, and botanical information database searches." Once again, although not funded through R25, these grants were appropriate to include in our study.

Third issue: ". . .regarding our [NCCAM] consumer publication on credentialing . . ."

Some confusion may have been caused by the inclusion of two separate hyperlinks when we referred to CEUs (Continuing Education Units) that can be earned through NCCAM's website. The first link (http://nccam.nih.gov/health/decisions/credentialing.htm) indeed does not, in itself, offer CEUs. We included it to point out some information offered to the public by NCCAM, but we apparently were not clear in that intent. The second link (not mentioned by Cotler) is to a series of video lectures (http://www.nccam.nih.gov/training/videolectures) that are offered free by NCCAM, although registration is required. The page explicitly states that the series is "developed for health care professionals to receive continuing education, [although] members of the public are invited to view the series and learn more about various aspects of CAM and CAM research" and that for health professionals who appropriately register "Post-tests must be completed with an accuracy of 70 percent or better to receive a CME [Continuing Medical Education] or a CEU credit. A maximum of 10 CME Category I credits will be awarded to physicians and a maximum of 12 contact hours will be awarded to nurses." One author (Engler) who registered when we began our research in order to view the lectures for research purposes (not for CEUs) is surprised to find that five of the ten lectures offered no longer are available "in an effort to keep the science current." Regrettably those no longer available include courses in: Mind-Body Medicine; Acupuncture: An Evidence-Based Assessment; Manipulative and Body-Based Thera-

pies: Chiropractic and Spinal Manipulation; and CAM and Aging. He began all of these courses with an interest in eventually discovering what evidence is offered, but they now, alas, no longer can be accessed. According to the page, NCCAM "will be adding new lectures," and he is interested in seeing what they will cover.

Final issue: ". . . the authors claim that our Web site does not mention any negative research findings . . ."

The authors did not read every publication for every study that NCCAM ever has funded. For those we did examine in depth, though—and keep in mind that we used NIH Reporter as our principal tool for finding and sorting grants—we found that the preponderance either had no publications listed—even years after completion—or that they principally covered study designs rather than results. We were able, using keywords and resources such as the clinicaltrials.gov website, PubMed, etc., to locate some publications not listed on NCCAM's own site, but, again, the dearth of negative findings was noticeable. We are aware that the Cochrane Collaborative (linked to on the research results page to which you directed us, http://nccam.nih.gov/research/results) is an independent resource, and we have used it and compared its information with more recent similarly peer reviewed articles and continue to use all resources and press releases from NCCAM on specific evidence which might reveal a CAM protocol as evidenced based medicine.

Our concern remains that millions of U.S. taxpayers' dollars have been and are being expended by NCCAM on research into CAM modalities that, long ago, have been shown to be ineffective—sometimes by other government agencies (e.g., magnet therapy). Specific to curricular and other education-oriented grants, our concern is that they seem to be funded with no regard to proven effectiveness of any CAM therapy, and that we have been unable to discern any community benefit attributable to any of them. One can only infer that negative feedback from clinical trials has, at least in some cases, not been forthcoming to those who award follow-on grants, and it has been our experience that negative results are not readily available to the public, including the authors.

The authors stand by our article and conclusions.

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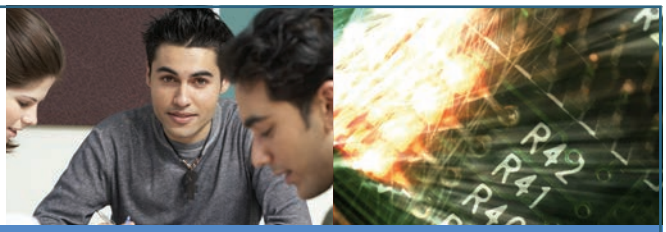
SCIENCE AND THE PUBLIC



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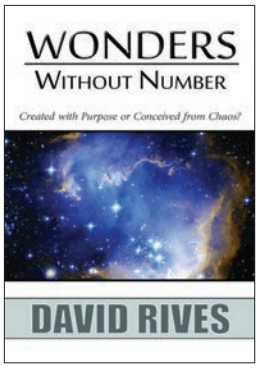
The Wonder of Creation Astronomy

PIERRE STROMBERG



Wonders Without Number: Created with Purpose or Conceived in Chaos? By David Rives.
David Rives Ministries, Lewisberg, Tennessee, 2012.
ISBN: 978-0-9857926-2-6. 146 pp. Softcover, $15.95.

If you've been a regular reader of the World Net Daily news website like I have, you've probably marveled over the bizarre weekly videos cobbled together by David Rives to promote "creation astronomy"—a thriving new branch in the tree of creationism. Rives has recently upped the ante by releasing a new book, *Wonders Without Number: Created with Purpose or Conceived from Chaos?*.

Right from the start, Rives reveals creationists' usual obsessive-compulsive disorder regarding the big bang: "You cannot have a Big Bang without enormous amounts of matter. So where did the matter come from? Has it always existed? What is the purpose of its existence, and how did it come to be?" (p. 8).

Rives recycles these rehashed leftovers from other creationists to essentially make the case that if the big bang cannot account for the origination of matter, the entire theory falls apart. In fact, the big bang does account for the origination of matter, in exactly the same way that exotic particles are created in particle colliders like the Large Hadron Collider: by converting energy to mass ($E=mc^2$). The nearly infinite energy density moments after the singularity event would result in a soup of particles of all types "condensing" out of the vacuum in a process known as "pair production," most of which are unstable and would decay back into energy almost immediately. Of these, only some are stable—namely electrons, neutrinos, and protons (and apparently dark matter).

Rives's claim that no one has any idea what happened before the big bang is also simply untrue. Brane cosmology and eternal inflation both explore concepts that could answer such questions. Others, such as the Hartle-Hawking no boundary condition suggest that space-time is finite. Rives continues with his big bang obsession until Chapter 4, where he turns his attention to biology, and spews forth all the usual long-debunked arguments you've come to expect from a creationist—Darwin, "Macro-evolution," the geologic column, uniformitarianism, Haeckel's embryos ("Well over 130 years after the time of Haeckel's work, school textbooks still use drawings based on his falsified illustrations," [p. 53]), etc.

It isn't until Chapter 5 that we finally get to the rest of astronomy. Rives echoes much of the same type of claims made in Guillermo Gonzalez's *Our Privileged Planet*. Rives draws a cartoon caricature of the Milky Way galaxy, exhorting us to thank our lucky stars that we happen to live exactly in the particular spot we currently occupy.

Rives casts doubt on the chances of life in the outer edges of the galaxy by echoing the claims of actual scientists like Peter Ward, who postulated that stars in the outer edges of galaxies would be unlikely to host Earth-like worlds because the rate of star formation is lower, hence, they are metal poor. However, recent discoveries have indicated that planets can be found orbiting even metal-poor stars. Rives continues to claim our fortuitous location, arguing that it "enables Earth to safely exist without the threat of powerful supernovae, black holes, stellar

collisions, or elemental deficiencies" (p. 62). Rives seems to regard these properties as unique, but given our current understanding of the Milky Way, these properties are replete throughout large areas of our galaxy.

Zeroing in on Earth again, Rives claims, "If the Earth was only 5 percent closer to the Sun, it would become like the planet Venus, boiling hot and uninhabitable. However, if we were just 20 percent farther away, our planet would resemble Mars, freezing . . . and still uninhabitable" (p. 63).

Rives also provides no caveats regarding a given body's mass relative to its ability to retain liquid water and sufficient atmospheric pressure. A ten-second search on the Internet reveals that while there are still debates as to the true extent of the habitable zone within our solar system, the boundaries range from 0.725 Astronomical Units to 3.0 Astronomical Units. (One AU equals the distance from the Earth to the Sun, ninety-three million miles.)

Another area Rives regards as unique is the fortuitous location of our solar system's gas giants. "Dangerous cosmic debris is pulled in by the massive gravity of the outer planets instead of proceeding closer to Earth" (p. 65). While this is true, recent analysis of Kepler's treasure trove of extra-solar systems show that we are by no means unique in this area either.

Rives falls into circular reasoning and marvels over the Earth's atmosphere with his assertion, ". . .only Earth has the correct combination of gases for life to exist. These conditions have not been found anywhere else in the Universe" (p. 67). In a true bit of comic relief, the notorious Yahoo! Answers provided better information regarding atmospheric changes during the Archean era than Rives could provide.

By the time we get to Chapter 7, "The Stars of Heaven," Rives takes us to the outer limits of human belief as he explains, "I would like to introduce you to my theory, which we will call The Rives Theory of Relativity" (p. 87). Simply put, Rives would like us to dispense with using light-years to measure distance and instead, "Relative to the speed of our fastest spacecraft, we can determine how long it would take to reach an object in space." Rives seems to find his theory both profound and significant but makes no attempt to explain why.

Rives seems to find his theory both profound and significant but makes no attempt to explain why.

Those of you who are familiar with creation astronomy may be wondering, "How does Rives handle the speed of light problem?" The answer is he doesn't. He doesn't even mention it. I looked carefully, numerous times through Rives's book and he simply doesn't address it. He doesn't mention Russell Humphreys's incoherent attempt to address the issue. He doesn't mention Jason Lisle's recent claims regarding instantaneous speeds for light ("Anisotropic Synchrony Convention"). Nothing.

The concluding chapter is about what you'd expect—ranting about "secular indoctrination," railing against unreasonable Christians who accommodate outrageous concepts like "science" and "reality," rolling out Stalin's corpse for the ten millionth time, and a terrifically ironic verse from the book of Proverbs, "Every word of God is pure: he is a shield unto them that put their trust in him. Add thou not unto his words, lest he reprove thee, and thou be found a liar" (Proverbs 30:5–6).

Rives equates contemporary astronomy with atheism and creation astronomy with true Christianity. Of course, nothing could be further from the truth. The vast majority of contemporary Christians have no problem with modern astronomy. Indeed, some even point to the big bang as a validation of their faith. The only threat from modern astronomy is to those who interpret the first chapter of Genesis in a literal manner, nothing more.

David Rives and other creationists realize the war is lost, so their game plan is to target the next generation. He makes this clear when he concludes, "As late as the 1940's, evolutionary doctrine was still being censored from textbooks; yet, today, one would do well to find even a casual mention of the Biblical account of Creation. . . . Today, universities originally established to teach Christian principles now take pride in religious diversity" (p. 138).

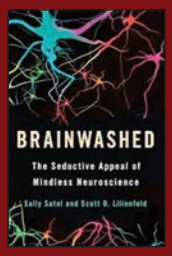
At the end of the book, David Rives is described as an "author, lecturer, and singer/songwriter." This review has provided an insight into his first two talents. One can only hope for his sake that history regards his third more kindly. ■

Pierre Stromberg has been a member of the organized skeptic community for more than two decades and was the founder of Pacific Northwest Skeptics. He has encouraged and organized grassroots opposition to creationism, exposed bogus claims regarding ancient artifacts, and conducted investigative work on exorcisms.

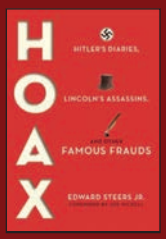
[NEW AND NOTABLE

Listing does not preclude future review.

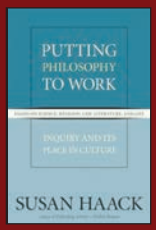
ABOMINABLE SCIENCE: Origins of the Yeti, Nessie, and other Famous Cryptids. Daniel Loxton and Donald R. Prothero. A welcome critical examination of claims and evidence about the best-known and most-familiar cryptids—Bigfoot, the Yeti, Nessie, the sea serpent, Mokele Mbembe (the alleged Congo dinosaur)—guided by the rules of naturalistic scientific inquiry and a commitment to critical thinking and skepticism. The opening chapter examines the difference between real science and pseudoscience in the context of cryptozoology, and the final one considers why people believe in monsters. Columbia University Press, 2013, 424 pp., $29.95.



BRAINWASHED: The Seductive Appeal of Mindless Neuroscience. Sally Satel and Scott O. Lilienfeld. A psychiatrist and a psychologist present needed scientific perspective about the often over-hyped (even faddish) current popular interest in neuroscience. They caution against over-interpretation of brain scans and simplistic arguments about their meaning, question overreliance on brain-based interpretations of behavior ("neurocentrism"), examine the "neuromarketing" of new technologies, and consider the legal implications of modern neuroscience. A balanced inquiry into how many real-world applications of neuroscience can obscure, rather than clarify, the many factors that shape our identity and behavior. Basic Books, 2013, 226 pp., $26.99.



HOAX: Hitler's Diaries, Lincoln's Assassins, and Other Famous Frauds. Edward Steers Jr. Foreword by Joe Nickell. An in-depth examination of six of the most amazing frauds in history—the Shroud of Turin, Piltdown man, the forgery of Hitler's diaries, counterfeit reproductions of "The Oath of a Free Man," conspiracy theories alleging that President Roosevelt had prior knowledge of the attack on Pearl Harbor, and details of Lincoln's assassination allegedly recorded in missing pages of John Wilkes Booth's journal. Greed and the desire to believe are at work in all six, the author says. University Press of Kentucky, 2013, 235 pp., $24.95.



PUTTING PHILOSOPHY TO WORK: Inquiry and Its Place in Culture. Expanded Edition. Susan Haack. The noted philosopher (and CSI Fellow) Susan Haack offers a collection of provocative and illuminating essays putting her philosophy to work on a whole range of real-world issues: truth, evidence, fact, objectivity, bias, self-deception, the demands of rationality, how unbiased inquiry differs from advocacy, how scientific inquiry differs from inquiry in other fields, threats to the integrity of science from political and commercial pressures, the tensions between science and religion, and the difficulty the legal system has in dealing with scientific testimony. Valuable new essays added to this expanded edition include a devastating critique of Karl Popper's philosophy of science and a critique of scientism. Prometheus Books, 2013, 345 pp., $23.00.

A Dangerous Blending of Nazi Fact and Fiction

PETER HUSTON

The Nazi Occult. By Kenneth Hite.
Osprey Publishing, Oxford, UK, 2013.
ISBN: 978-1-78096-598-7. 80 pp.
Softcover, $17.95.

Osprey is a specialty publishing company aimed primarily at military modelers, wargamers, and other hobbyists. Their products have a well-deserved reputation for packing a great deal of hard-to-find, specialized information in a small number of pages along with many high-quality illustrations, charts, maps, and photographs, despite occasionally spotty citing of sources. In some circles, if one wants a particularly obscure piece of information regarding military uniforms or equipment, e.g., the exact type and shade of socks worn by Napoleon's various hussar regiments sorted by year and campaign as well as by unit, a relevant publication from Osprey is considered the immediate "go-to" source. I have many of its books and am generally highly pleased with them.

However, Osprey is branching off in new directions, presumably to cater to the market for hobbyists and modelers interested in fantasy subjects. For the record, I don't have a problem with this. If a hobbyist or wargamer wishes to buy a nicely illustrated, concise publication summarizing the story of Jason and the Argonauts or Norse mythological tales or even zombies—and someone wishes to publish it—I don't have a problem with

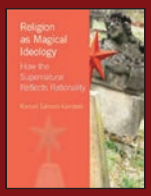
that. History is history and fantasy is fantasy, but they can both be fun and they most certainly can make fascinating reading. Each has its place.

Unfortunately, *The Nazi Occult* blends the two. It is a historical fact that some of the people involved with the Nazi movement had an interest in the occult; some held strange beliefs, and some acted in strange ways due to these beliefs. The exact extent and influence of these beliefs on the Nazi movement and its ideology and actions is highly controversial and has been written about by many people, often with wildly varying accuracy and scholarship. (In fact, I have a shelf of books on this very subject—some good, some not so good.)

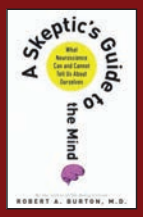
I'd been hoping this work would survey such writings and the beliefs and practices they describe and put them in their proper place in an easy-to-read, concise, single volume. Unfortunately, this volume makes no effort to place its topics in context, nor does it discuss the reality of the ideas shared within. Instead it purposely blurs the distinction between fact and fiction. This is dangerous with such a topic.

For example, it seems to be historical fact that Guido von List's beliefs in runes, Germanic folk beliefs, and "recreated traditions" of perceived Germanic folk beliefs—and his teachings based on these ideas, called "Ariosophy"—did have an influence on Nazi belief in the alleged superiority of the "Aryan race" and "the Volk." This is described in this volume without footnotes as if it were historical fact.

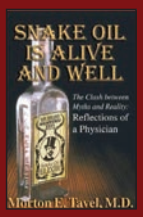
Also, it seems to be pure nonsense, despite belief in some circles, that the Nazis built UFOs and after the war housed them in a secret base in or under Antarctica. This belief, although silly (see Massimo Polidoro's column "Hitler's South Pole Hideaway," SI, January/February 2013), has been linked with some prominent holocaust deniers, such as Ernst Zundel, who may have been using such a strange belief to "hide in plain sight" so that people would dismiss their holocaust denial activities as the work of "deranged UFO nuts" and therefore not interfere with them. Unfortunately, this subject is also described without footnotes as if it were historical fact. In fact, the work contains a very nice painting of American fighter



RELIGION AS MAGICAL IDEOLOGY: How the Supernatural Reflects Rationality. Konrad Talmon-Kaminski. An examination of the relationship between rationality and supernatural beliefs arguing that such beliefs are products of evolution, cognition, and culture. The author does not offer a false rapprochement between reason and religion but explores their interrelationship as a series of complex adaptations between cognitive and cultural processes. Acumen Publishing, 2013, 160 pp., $95.00.



A SKEPTICS GUIDE TO THE MIND: What Neuroscience Can and Cannot Tell Us About Ourselves. Robert A. Burton, MD. Concerned about seeing "the most complex aspects of human behavior reduced to sound bites" (such as the recent headline "Possible Site of Free Will Found in Brain," the author (like Satel and Lilienfeld in their book listed on p. 58), thoughtfully examines often unsupportable or contradictory behavioral observations emerging uncritically from brain scans and other physical observations of the brain. In doing so he pursues a basic premise: "Our brains possess involuntary mechanisms that make unbiased thought impossible yet create the illusion that we are rational creatures capable of fully understanding the mind created by these same mechanisms." St. Martin's Press, 2013, 264 pp., $24.99.



SNAKE OIL IS ALIVE AND WELL: The Clash between Myths and Reality—Reflections of a Physician. Morton E. Tavel, MD. An exploration of modern snake oil—quackery of all sorts and treatments that lack scientific credibility (including faith healing, acupuncture, chiropractic, misinformation about diets and vitamin supplements, antioxidants—from a medical and psychological perspective. A valuable opening section on general biases and pitfalls is essentially a guide to thinking about our own biases (e.g., chapters on regression toward the mean, hindsight bias, cause-effect illusions, etc.). The second section is on health fallacies and misconceptions. The third considers confusions between science and religion. Brighton Publishing, 2012, 246 pp., $13.95.

THE WAY OF SCIENCE: Finding Truth and Meaning in a Scientific Worldview. Dennis R. Trumble. A book about the deeper benefit of science, a thoughtful rumination on the critical-thinking tools that science has to offer and the value and pleasures of basic science literacy. Trumble emphasizes that the methods and facts of science are accessible to everyone, that scientific rationality and critical thinking are good for our physical well-being and our sense of morality, and that the scientific worldview offers a profound sense of wonder, connectedness, and optimism about the human condition. Prometheus Books, 2013, 375 pp., $20.00.

—Kendrick Frazier

planes dogfighting with Nazi UFOs over the Antarctic in 1946. Again, the captions describe this battle as if it were a documented historical event. The two ideas are presented as if equally valid.

The author also presents statements about yetis, zombies, lycanthropes, and sorcerers controlling the weather, among other things, as if they were real and had been a part of the events of World War II.

I admit at times I had trouble telling the fact from the fiction.

At no point does the work state that this is supposed to be a survey of imaginary beliefs or a work of fiction. My guess is that the author and publisher considered many of these ideas to be so silly that they felt there was no need to do so. Yet the back cover states, "Now, using a combination of photography and artwork reconstructions, the true story of the most secret battles of World War II can finally be told." Not exactly a disclaimer.

Unfortunately, if there's one thing I've learned in years of watching the fringe, no matter how absurd or stupid an idea is, someone somewhere is going to take it seriously and believe it—especially so if it's printed by a legitimate publisher of historical works. Doubly so if it is about something like Nazis.

I admit at times I had trouble telling the fact from the fiction. Did the Nazis, as described in this book, use specially trained soldiers, *hexensoldat*, who searched for landmines with dowsing rods? I have no idea, but I seem to recall somewhere that the U.S. Army, despite there being zero scientific evidence for the validity of dowsing, has experimented with its use to find landmines, so it might be possible.

Did a self-professed medium named Mathilde Ludenhorf really consider the Dalai Lama (of all people!) to be the head of "the worldwide Jewish conspiracy" as claimed on page 39? I decided to dig a little on this one; I found nothing in three respected books, but a properly footnoted Wikipedia page says she did, so it seems to be true. But using the Osprey book alone, one simply cannot tell fact from fiction, and that's not good.

The recommendations for further reading section includes a mix of legitimate works of scholarship, books written by people whom I consider to be "true believers" and those who, in my opinion, "make stuff up to see their name in print" with no distinction between them. A small selection of games, comics, and movies are also recommended for people with an interest in this subject.

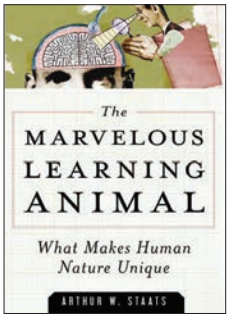
I have nothing against hobbyists, modelers, and wargamers who wish to have fun using fantasy ideas. I recently played in a table-top wargame set in modern times where our side's goal was to rescue some scientists from telepathically controlled zombies. For a couple hours, with much dice rolling, rule consulting, and even some strategic decision making, we had fun despite the fact that I believe in neither telepathy nor zombies.

However, I do think that Osprey should have thought more before publishing a book on the Nazis of World War II that blends fantasy and reality without making any attempt to enable the reader to distinguish between the two. It's dangerous and of questionable taste. I hope that future volumes of the series will make this distinction clear. ■

Peter Huston is an author and educator with a background in Asian Studies and teaching English as a second language. He blogs at http://www.peterhuston.blogspot.com.

A Fundamental, Costly Error

PETER LAMAL



***The Marvelous Learning Animal: What Makes Human Nature Unique*.**
By Arthur W. Staats.
Prometheus Books, Amherst, New York, 2012.
ISBN: 978-1-61614-597-2.
402 pp. Hardcover, $23.77.

In his new book *The Marvelous Learning Animal*, Arthur Staats's concern is with what he designates as "The Great Scientific Error," which he says should be made explicit. The error consists of considering behavioral traits the same as physical, biological traits. A major problem with the error is that in trying to understand human behavior it largely leaves out learning, instead emphasizing biological factors, inherited traits, and innate tendencies. Recent groundbreaking human genome research has reinforced this approach.

Staats proposes a new paradigm for understanding human behavior. According to this paradigm, human nature and human behavior have developed primarily though learning. The brain is often considered the cause of how we behave. Staats rejects this notion. He considers the brain to be a mechanism that enables our learning, including learned emotional behavior. There is no natural separation between biology and learning, nature and nurture. They are complementary. In this view, learning is a biological process. But to understand learning we must study learning, not biological phenomena such

as genes or pharmacology.

All of us have unique learned "repertoires of behavior." Individuals with certain repertoires of behavior, for example, when faced with novel situations, will respond with novel behaviors that are creative, that are discoveries. Creativity is not the result of unique minds but of learning. The framework Staats advocates resolves the long-standing separation of the internal mind/brain and external behaviors. Sufficient knowledge of the basic behavioral repertoires will enable our understanding of the workings of "the mind," such as thinking, problem solving, and creativity. This knowledge Staats calls "the missing link." Consider intelligence; intelligence tests predict individuals' learning. They do this because they measure samples of the basic behavioral repertoires necessary for effective learning and performance across a wide set of situations.

Staats's theory is exemplified in his consideration of personality, which is the opposite of the traditional view of personality that emphasizes inferred internal causes. Personality is an internal cause of behavior, as learning recorded in the brain, but that internal cause is composed of learning repertoires of behavior. Because the real causes of personality have never been sufficiently explored, the traditional concept of it has been, and is, an inference attributed to causes such as genes, brain, and mind. This view of personality illustrates, Staats says, the Great Scientific Error's neglect of learning. If you want your child to be intelligent, there is no way to manipulate genes or the brain to ensure that goal. If you do not want the child to have temper tantrums, there is no biological preventive. Rather, a child who has learning experiences that result in desired behavior repertoires will thus have an attractive personality.

But, Staats points out, we have no good evidence of the learning that produces normal or abnormal behavior repertoires in childhood. We have not even begun studies of how human normal and abnormal behavior is actually learned.

With respect to cultural evolution, Staats says there is no such phenomenon. Cultures do not develop according to the principles of genetic natural selection. The human-selection theory of cultures is defined as the behaviors of humans in particular groups as well as what those groups produce. The cultural advances of all the humanoid species resulted from cumulative learning. Thus questions about particular aspects of cultures should focus on the cumulative learning resulting in those aspects—rather than possible genetic causes.

The paradigm of humanness that Staats describes calls for changes in basic and applied science and human science. In the fields devoted to the study of human development and practices explanations draw on the biological sciences. There is no awareness that the critical facts of basic and human learning have not been used to explain and deal with human behavior.

The bottom line: "Humans and pigeons [and all other nonhuman species] learn by the same principles, yes. But humans can learn more by an unbelievably huge amount. And that learning also involves new principles" (p. 150).

This book is somewhat repetitious and overwritten, but that feature may benefit people unfamiliar with behaviorism. The fundamental point Staats makes needs to be addressed by those who are concerned about the causes of human behavior. ■

Peter Lamal is a fellow of the Division of Behavior Analysis of the American Psychological Association and a member of the Association for Behavior Analysis International.

INBOX]

Skeptical Inquirer
OLIVER SACKS INTERVIEW
Nurturing Non-Science: Startling Concepts in Physician Education
Climate Change Denial in the Classroom
New Revelations on 'Best Monster Photo'
SPECIAL REPORT: Bizarre Bigfoot DNA Study
Valuing Science with Differing Values

Best Lake Monster Photo?

I was struck with the "World's Best Lake Monster Photo" ("New Information Surfaces on 'World's Best Monster Photo,' Raising Questions," SI, May/June 2013) and realized I could estimate the monster's size without a trip to the lake. I used three basic facts:

1. Virtually all cameras cover in the narrow direction a total angle of about twenty-four degrees. If larger, the lens is classified "wide angle"; if smaller, "telephoto." Using this we can estimate the angle between the top of the monster's head and the water: about two degrees.
2. Lake Champlain trees are about 100 feet tall. In the photo, the trees directly behind the monster subtend an angle of about three degrees. From that, and simple trigonometry, the far shoreline is about 2,000 feet away.
3. The camera was probably about five feet high. The angle between the monster's water line and the distant shore is about six degrees. Use the fact that the lake is level, and trigonometry gives the distance to the monster: about fifty feet.

Using the distance, we calculate the top of the monster's head looms 1.7 feet above the water.

The calculation is approximate, and I've rounded the numbers to reflect this, but even if you play with the parameters it is difficult to get a monster substantially larger. If some call this a "monster," it is certainly not in the class of Nessie.

Richard Muller
Professor of Physics
University of California, Berkeley
CSI Fellow

The 1977 photo of "Champ" taken on Lake Champlain can be dismissed as a hoax on its own evidence.

Does this animal breathe with lungs or with gills? If with lungs, then it must constantly surface to survive, a constancy that eliminates it as native to any lake that freezes over in winter. But if it breathes with gills, then why is it on the surface with its long neck, head, and gills so high out of the water? What evolutionary pressures would produce a gilled animal that swims as if it had none?

With gills, Champ (or perhaps Chump) could remain under the surface and undetected indefinitely, but the photo argues against gills. But if it surfaces to breathe then it has done so, either in Lake Champlain, the Richelieu River, the St. Lawrence Seaway, or the Atlantic, for thousands of years of human habitation—and apparently with no other evidence for its existence except this photo.

R.K. De La Hunt
Seattle, Washington

Bigfoot DNA Claim

Thanks for the Bigfoot DNA article in your May/June 2013 issue. I always enjoy reading articles that expose all the hokum that surrounds us. As for Bigfoot believers, they need to explain several things (aside from the fact that no Bigfoot has ever been definitively observed and identified): Why have no carcasses or bones ever been found? Why have Bigfoot hunters never found fur or scat? Why do we have only hoaxed photos and footprints? And a problem I've not seen raised before: for any species to survive, there must be a minimum number of healthy individuals capable of reproducing. What that number might be for Bigfoot is unknowable (as it is for unicorns and griffins), but it must be sufficiently high that biologists and other legitimate researchers should have found definitive evidence of its existence by now. Obviously, they haven't, and neither has anyone else. These same questions can be asked about other cryptozoological creatures such as Yeti, Champ, and Nessie. It's a shame that all the time, effort, and money spent debunking Bigfoot can't be used for far more worthwhile purposes.

David Gardner
Seattle, Washington

Science, Government, and Libertarian Values

Barry Fagin ("Valuing Science with Differing Values: Let's Broaden the Debate in the Skeptical Movement," SI, May/June 2013) presents a balanced defense of libertarianism. He is correct; it fosters skepticism, enables one to break from superstition and theological purity, reinforces empiricism, and embraces logic and science. As a liberal I acknowledge these points and am sympathetic with them.

But, and yes, there must be a "but," he does not touch on what would replace the government whose size and invasiveness libertarians deplore. Progressives are suspicious of a society where free markets operate with minimal regulation, corporations are governed by the "silent hand," and services are privatized. We welcome libertarian skepticism, but most of us who have read Ayn Rand are repulsed by a culture steeped in stress and stripped of empathy, altruism, and social support systems.

Ironically, it is in countries with supportive governments that skepticism thrives. As Norenzayan and Gervais ("The Origins of Religious Disbelief," *Trends in Cognitive Sciences*, 17, 20–25, 2013) note, progressive democracies that reinforce mutual caring have the highest levels of support for science and the lowest levels of religiosity. When people feel secure—when government protects the environment, provides universal health care, supports education and infuses the culture with an empathic collectivity—people are most free.

In my experience, when you infuse a libertarian with empathy you get a liberal.

Arthur S. Reber
Visiting Professor
University of British Columbia
Vancouver, Canada

In his May/June forum column, Dr. Fagin argues that evidence, presumably scientific evidence, shows that ". . .governmental approach[es] to problems do not work particularly well. . . ." He asserts that government regulations intended to address climate change will probably advance a political agenda and "values" that he and like-minded individuals oppose, so he advocates for a libertarian society.

While I appreciate Dr. Fagin's measured tone, current libertarian thought misses an essential point about society: Not everyone starts out in life with the same resources and opportunities. Compare being born a slave destined to die in the Roman Coliseum with being born a middle class kid in Oklahoma City, whose parents ensure that she or he goes to an excellent state university.

People from all over the world still seek residence in the U.S.—not because their governments are overreaching but because their governments don't work as well as this one does.

Current libertarian thought carries the belief that governments inherently restrict freedoms. This would include one's perceived right to drive vehicles, burn fuel, and own weapons as he or she pleases. Each of these activities affects neighbors. When it comes to the atmosphere, one's activities affect everyone else on Earth.

Libertarians may be concerned about protecting you from your government. But it works another way as well: government serves to protect me from you.

Bill Nye
CSI Fellow

I found the juxtaposition of Pigliucci's article on burden of proof and Barry Fagin's article on libertarian skeptics to be illuminating. The skeptical position on psychics, faith healers, UFOs, and so on is that the burden of proof rests on the person making extraordinary claims. Contrarily, those who promote these positions presume that the burden of proof is on the skeptic to show that the phenomena cannot possibly be true. My experience with libertarians is that they treat the idea that governmental regulations might be useful as an extraordinary claim. In the unfortunately not-so-extreme case this can lead to paranoia, or as Fagin states it, "Is it really so beyond the pale to think that global efforts to address anthropogenic global warming are at risk to be hijacked by others with a much more expansive agenda?" Read the blogs. The scientists lie, the liberals and environmentalists scheme, and all others are dupes or idiots.

I am glad to see that some libertarians do accept the science of global warming, but Fagin didn't present anything positive in terms of solutions. I am enough of a liberal to not appreciate the liberty of all frying together because government restrictions on individual liberty are not acceptable. If libertarians have nongovernmental approaches to ameliorate the problems of global warming, they should present them.

Robert Clear
Berkeley, California

Barry Fagin was spot on in his patient explanation of why some of us skeptics are libertarian or conservative. For very good, evidence-based reasons we do not have confidence that big government is the best, or even very good, at solving problems. So I applaud your begrudging concession that there may be a few living, breathing non-liberal skeptics among your readership. For instance, you might be surprised to learn that I support the moral value that a prosperous society can and should come to the aid of those unable to help themselves. But how in the world did that metastasize into the insurance

nightmare created by Obamacare? Any fair-minded person who has watched in horror as daily newspaper reports continue to expose monstrous cost overruns and unintended consequences being generated by Obamacare should share our disgust.

Yes, I am politically conservative, because I am skeptical of liberals who resist learning anything from one failed big society program after another. Think of it this way: We don't address hunger by making everyone buy hunger insurance. We give the hungry food or stamps to buy food. We don't address homelessness by making everyone buy housing insurance. We give the homeless free or subsidized public housing.

John Clinger
Midlothian, Virginia

Barry Fagin replies:

Professor Reber raises a number of thoughtful points, which space restrictions do not permit me to address fully. It is interesting, though, that he writes from Canada, a country which has had a freer economy than the United States for the past two decades. While hardly a libertarian paradise, Canada does enjoy the benefits of modest military spending, lower corporate tax rates, stable government fiscal policy, and enthusiastic support for immigration. I and other libertarians are working to see the U.S. enjoy the benefits of similar policies.

I disagree with the implication that having empathy is both a necessary and sufficient condition (or at least must be strongly correlated) with being a liberal and supporting the modern redistributive state. But I would suggest that despite that disagreement, the features of the modern welfare state that liberals desire the most can be funded with a national government between ten and twenty percent the size of the one we have now. The huge majority of governmental expenditures go toward rapidly growing entitlements, something that only libertarians seem willing to talk about.

I believe that Bill Nye (may I call you Bill? I feel like I know you so well) errs in stating that libertarians miss the point that not everyone starts out in life from the same position. We merely disagree with liberals as to what follows from that. He also conflates, to my mind, two distinctly different ideas: Government as an agent of fairness with government as a protector of individual rights. The strength of the connection between these two concepts, if any, is a key difference between liberals and libertarians, one not likely to be resolved in these pages.

It is a long reach to go from "government regulations might be useful" to embracing a government the size and scope of the one we have now. My main point was that a skeptical approach to understanding how government actually works and why that is, as opposed to how it is supposed to work and how it could be if we just voted for the right people, is an appropriate one for skeptics to take. I believe it will lead to policies that are more libertarian than they are liberal or socially conservative, but for the moment I'd just like to get this perspective into the world of ideas that SI represents.

Climate Denial in the Classroom

The number one denialist tool box item in the article by Hassall et al. ("Climate Change Denial in the Classroom," SI, May/June 2013) is the professor's "The only constant about climate change is change"—a howling denial of free will.

As Daniel Dennett says in *Freedom Evolves*, we humans have the ability to imagine a variety of futures and choose among them. In addition, we have demonstrated the ability to "terraform" Earth to suit us. Pretending that Earth "just happens" shirks responsibility and also pretends that we do not have the free will to imagine our futures and make a choice. Of course by going on with our little lives, we have made a choice—just not a thoughtful one.

John Dooley
Lancaster, Pennsylvania

Interstellar Travel: Preposterous?

It was disheartening to see the normally credible Skeptical Inquirer publish such an unscientific article as Robert Sheaffer's "Is Interstellar Travel 'Preposterous'?" (SI, May/June, 2013). Sheaffer uses remarkably unscientific terms ("completely preposterous" and "utterly implausible") to refer to interstellar travel. Does this mean impossible, really hard, or simply that our society doesn't know how to do it yet? He appears to be arguing that interstellar travel is impossible for us or any other civilization, no matter how advanced. To do this he references three reports from the 1960s and entirely ignores more recent, and more thorough, studies to the contrary.

Perhaps the most knowledgeable expert in this arena was Dr. Robert Forward (1932–2002), who spent a significant portion of his career at Hughes Research Center where he created and published the most extensive bibliographies of interstellar travel available, largely in the *Journal of the British Interplanetary Society*, JBIS. Forward's exceptionally well-researched conclusion in 1986 was that "Interstellar travel is difficult, but it is not impossible" (JBIS, 39/9). An essentially similar conclusion was reached in 1999 by Giovanni Vulpetti (JBIS, 52/9). A brief summary of both about how exceptionally difficult interstellar travel is and the nature of some of the possible solutions is given by Wertz (*Orbit and Constellation Design and Management*, 2001, p. 654–664).

James R. Wertz
Rolling Hills Estates,
California

I'm not sure whether "Psychic Vibrations" is the sort of column that one should try to correct, but today's scientific community is certainly not convinced that "the concept of interstellar travel is utterly implausible." On the contrary, NASA and DARPA started an organization called "100 Year Starship" to investigate the possibility of interstellar travel in the next century. There have been two 100 Year Starship public symposia. (I spoke at the first of these in 2011.)

While this project has attracted a certain percentage of kooks, most people associated with it are serious scientists who understand the difficulties raised in the articles Sheaffer cites but nevertheless find the idea worth considering.

Will human technology 100 years hence permit the creation and use of hundreds of tons of antimatter, or the building of an ultra-powerful laser that could accelerate a spacecraft to relativistic speeds? We cannot know, any more than scientists of 1913 could have predicted today's technology. It's certainly possible. It may not happen, but it's not preposterous.

This has nothing to do with UFOs. There are many good reasons to reject the idea that UFOs are alien spacecraft. But the supposed impossibility of interstellar travel is not one of them.

Ken Olum
Sharon, Massachusetts

Robert Sheaffer's article on interstellar travel is an important reminder of the limitations placed on space flight by the laws of physics. But it's important that space travel "pessimists" not overlook another way to solve the problem. To travel to the stars, all humanity has to do is live longer. A lot longer, to be sure, but happily not forever.

Spacefaring distances are "large" and space travel times are "long" only in comparison to the present paltry life span of human beings. If we can extend the typical human lifetime by a factor of ten, a *2001*-style voyage to Jupiter becomes feasible. Another factor of ten gets us out past Pluto. And so on. All this at velocities well below *c*.

There are probably inherent limits to the present meat bags that house human consciousness. But with the increased augmentation of the human form

with mechanical and computational components, who knows how far we can go ere we must shuffle off our mortal coils. Naturally we still have to find the fuel to get there, design spacecraft that can last centuries, and solve a host of other problems. But these problems all have one compelling feature: they are engineering challenges, not violations of physical laws.

Barry Fagin
Colorado Springs, Colorado

In "Is Interstellar Travel 'Preposterous'?" Robert Sheaffer does an excellent job of explaining why interstellar travel is physically impossible.

However, the possibility of interstellar *communication* is left open, as he notes in stating, "Purcell concludes his paper by demonstrating that interstellar communication using radio waves is perfectly possible." It would be very interesting if the Skeptical Inquirer could publish an exposition of this by an astrophysicist.

Since interstellar travel has been ruled out, interstellar communication would have to be with some intelligent beings that have evolved on a planet near one of the nearby stars. The probability of life having evolved to such a level of technological intelligence on one of those few stars would seem to be very slim. Also, the timing of that evolution would have to be synchronized exactly with our own. One characteristic of intelligent behavior is that if unrewarded it is not repeated for long. If intelligent beings on another planet were a hundred years ahead of us in technological development, they would have given up attempting to communicate with us before we were ready to listen. If they are one hundred years behind us, we will have given up the attempt to communicate. And if communication requires a focused beam, we would need to know exactly where to aim it. So, it would seem that the search for and attempts to communicate with extraterrestrial intelligence will most likely fail.

David W. Briggs
Marion, Massachusetts

Robert Sheaffer replies:

I seem to have stirred up something of a hornets' nest by presenting physics Nobel laureate Edward Purcell's argument that interstellar travel is "preposterous." Perhaps I should have specified "relativistic interstellar travel," the kind that Stanton Friedman and many UFO proponents keep talking about, supposedly making it possible to travel to another star within a single human lifetime (assisted by time dilation).

There is nothing to prevent interstellar travel so long as it is "long and slow." The distance to Alpha Centauri, the very nearest star system, is 4.37 light-years, 1.34 parsecs, or about 276,000 astronomical units: about 50,000 times the average distance to Jupiter. It took Pioneer 10 and 11 approximately eighteen months to reach Jupiter. At that speed, it would take more than 80,000 years to reach Alpha Centauri. Of course it is possible to go faster than that. But even if we could eventually go 100 times faster than present-day probes, we are still looking at a one-way trip of around 800 years. Be sure to bring plenty of movies to watch during the voyage. While long interstellar trips such as these are no doubt technologically possible, they are "preposterous" for completely different reasons.

Mr. Fagin suggests that long and slow space travel might not be so objectionable if we could radically extend human lifetimes, through technological means. He is probably quite right about that. Perhaps I might even someday be uploaded onto a computer (or perhaps onto many computers), to sail off on a voyage across the galaxy. But whatever is going out there, is it really me? Maybe we should just do the bit about radically extending our lifetimes, and then stay here and enjoy it?

Many people seem to forget that what is technologically possible is limited by fundamental laws of physics, like the conservation of energy and momentum, that must be obeyed by all civilizations in the universe, no matter how advanced. Mr. Olum asks, "Will human technology 100 years hence permit the creation and use of hundreds of tons of antimatter, or the building of an ultra-powerful laser that could accelerate a spacecraft to relativistic speeds?" But that is exactly the kind of scenario that Purcell considered and rejected. As Purcell noted, to accelerate one unit mass to .99c requires fourteen units of convenient matter/antimatter fuel, safely stored (what do you use to contain tons of antimatter?), converted (somehow) to energy with 100 percent efficiency, and directed (somehow) to create a thrust exactly in the direction we wish to go, while shielding (somehow) the passengers, and indeed the entire Earth, from extremely intense gamma rays. But that already implausible scenario assumes that you don't plan to stop when you reach your destination; you will just fly right on by. If you want to stop, then you must accelerate your deceleration fuel (in that same ratio), and your fuel to payload ratio is now 210:1 (when you reach full speed, you will have one unit of payload, and fourteen units of deceleration fuel, meaning you need to start with 14 x 15 units of fuel). That's for a one-way trip. For a round trip (assuming there are no convenient filling stations along the way), you must start with over 40,000 units of matter/antimatter mix for each unit of payload. Have we reached "preposterous" yet? And remember you can't claim "future technology" will do better, because we are assuming 100 percent perfect efficiency. The powerful laser is an interesting suggestion. However, something has to power that laser; it won't power itself. We could not do better than to use the perfect matter/antimatter engine imagined above. Your laser will, of course, be less than 100 percent efficient, because every device is, so those fuel ratios increase. Also I hope that your laser comes with a truly gargantuan heat sink to draw away the small percentage of that enormous energy flow that becomes waste heat before it melts everything in the vicinity.

Dr. Wertz complains that I referenced "three reports from the 1960s" about interstellar travel. However, the laws of physics have not changed since then, so their conclusions remain valid. As for Robert Forward's proposals for interstellar travel using a light sail, we still would need a microwave laser in our solar system that somehow generated one GW of power (or 1/100 of all the energy being used on Earth) to accelerate a payload of only sixteen grams (less than an ounce!) for a trip to Alpha Centauri in twenty years. While it may be possible to someday use such a device to return data about nearby stars, as a proposal for interstellar travel this is clearly "preposterous."

Mr. Briggs is concerned that even SETI might be technologically impractical. Of that, we don't need to worry. SETI scientists are confident that they could detect strong signals sent to us from 100 or more light-years away, and their equipment gets better all the time. The impossible question is: Is anybody out there in that stellar region transmitting to us?

Obesity Science

The column by Kenneth W. Krause "Obesity: What Does the Science Say?" (SI, May/June 2013) challenges the "energy balance" (EB) concept as being too simple an explanation for increasing obesity. Differences in metabolism related to several other factors certainly must contribute. He cites research on sugar by Robert Lustig as one such factor. However, from certain media reports of Dr. Lustig's studies, he may have carried his theories too far when he calls sugar "addictive." Others of like mind have claimed modern foods constitute a "toxic food environment" and have gone on to claim that personal control and responsibility are not useful. This idea has lead to calls for restrictive

laws and regulations that have no scientific basis, for example the proposed banning of the sale of large containers of soft drinks in New York City.

You may find a new book helpful. *The Food Police* by Jayson Lusk presents a broad perspective on today's food system based on facts that are objective and consistent. The author grew up on a working farm, studied food science in college, and has worked in both farming and food processing. He later went into agricultural economics and is very aware of the day-to-day choices facing anyone trying to farm the land or raise a family. Mr. Lusk does not work for the food industry but is a professor at Oklahoma State University. He has plenty of his own criticisms of industry and government as well as of the Food Police.

I have been a reader of the Skeptical Inquirer for several years and find it especially valuable in areas where questions have become so politicized that sorting out the correct and objective scientific facts has become very difficult. One example of this is global warming, which must be resolved (if it can be resolved) based on the very best science, not politics! Hopefully you can do the same for obesity.

Phillip R. Wells
Food Scientist (Retired)
South Hadley, Massachusetts

Kenneth Krause's "Science Watch" missed the robust literature of over sixty original studies, most of which find an association between decreased sleep duration and an elevated body mass index (BMI), the marker of being overweight or obese. The effect appears strongest in children and young adults and has been found in many different populations including urban, rural, and third world countries. This observation may be part of the reason why some people take in excess calories. There are probably multiple factors involved, with the mechanism and power of each yet to be clarified.

Edward Schuman, MD
Meadowbrook, Pennsylvania

It is with great interest that I read K. Krause's article on obesity. Is the author familiar with the Montignac diet, which has proved very popular in Europe? This diet is based on the glycemic index of foods and recognizes the impact of all carbohydrates on the fattening process. Besides doing away with the calorie myth, it recommends dissociating the intake of fats on the one hand and sugars (carbohydrates) on the other, since hyperglycemia induces a discharge of insulin, which transforms lipids (and excess sugar) into body fat. Montignac extols the virtues of the Mediterranean diet, which is basically that of Southwestern France (the "French paradox"), where the health index is the best of the country (Lille in the North being at the other end of the spectrum): vegetables, garlic, fruit, but also red wine, duck meat, and foie gras! (Duck contains mainly HDL lipids—good cholesterol—so go for it!)

Unfortunately, it seems most nutritionists have been weaned on calorie counting, which assumes that the human body works like a furnace, and this is *not* the case: our body adapts to intake, and calorie starving can lead to the undesired result viz. obesity.

Congratulations on your journal; keep up the good work debunking pseudoscience.

D.A. Johnson
La Hulpe
Belgium

Kenneth Krause responds to readers in his column in this issue, "Obesity Redux," p. 23.

Bayesian Analysis Prejudicial?

Please allow me to suggest two clarifications to Massimo Pigliucci's column "Whose Burden of Proof?" (SI, May/June 2013).

The article states that there is no difference between making a scientific claim and denying it—"to claim P is the same as to deny not-P." While true, it implies that denying and skepticism are equivalent, when they are very different in substance and process. Denying something is indeed a scientific claim and does have a burden of proof. However, a skeptic requesting proof, evidence, or definitions is not making a scientific claim and carries no burden of proof. Should we bear a burden of proof to ask a dowser for evidence or to define his claims? I think not.

The second point is that a Bayesian philosophical framework has a serious flaw. Bayesian Inference is only one of many philosophies of science. It is distinguished by its partial dependence on prior judgments ("prior probability") to alter conclusions about whether a hypothesis is valid or not. By doing so Bayesian Inference essentially enshrines prejudice in an experiment's result.

Imagine allowing a preconceived conclusion to affect the result of an experiment—the result is irreversibly tainted. Because Bayesian analysis allows use of a previous conclusion, it loses its claim to purely merit-based decisions.

David Dilworth
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Massimo Pigliucci replies:

When I pointed out the logical equivalency of p or ~p I did not mean to imply that denial and skepticism are themselves equivalent. But skeptics cannot simply help themselves to the "you are making a positive claim" rhetorical move, since any positive claim can easily be turned into a negative one.

Concerning Bayesianism, it is certainly the case that it is one of several types of philosophical account of scientific epistemology, and it is also true that it has flaws (though I disagree with the modifier "deep"). Still, it is widely acknowledged to be useful in both science and philosophy, and it is particularly helpful when thinking about burden of proof. Also, it is incorrect to say that it "enshrines prejudice in an experiment's result." Rather, it helps make explicit and quantify the scientist's judgment, which is inevitably subjective to begin with. In general, there is no such thing in science as "purely merit-based decisions," since all decisions are human judgments and therefore inherently subjective. (Of course this doesn't mean that such judgments are arbitrary or made regardless of evidence.)

Aircraft Death Spirals

Concerning the likely 1978 "spiral and crash" of UFO reporter Fredrick Valentich, discussed in the "Psychic Vibrations" column in the March/April 2013 issue, the U.S. Air Force had long been aware of the problem.

In 1968, as a lowly proofreader for a specialty publishing firm, I read an Air Force flight safety manual that addressed exactly this issue. Flyers on dark nights or in clouds where they could not get visual confirmation of the horizon would enter a spiral, tight or loose, and the centrifugal force would give them the seat-of-their-pants feeling that they were flying straight and level.

An attempt to correct to the horizon as indicated by the attitude indicator instrument would feel very wrong, so pilots would return to what "felt" right, assuring their speedy deaths unless they were fortunate enough to get a visual sighting in time to straighten up.

The lesson was, "believe your instruments."

Lance Benson
Milton, Nova Scotia
Canada

[FEEDBACK

The letters column is a forum on matters raised in previous issues. **Letters should be no longer than 225 words**. Due to the volume of letters we receive, not all can be published. Send letters as email text (not attachments) to letters@csicop.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122.

SKEPTICAL ANNIVERSARIES

by Tim Farley

September 10, 2008: CERN's Large Hadron Collider was first powered on; despite the claims of some, it has not yet destroyed the Earth.

September 10, 1993: Emmy-winning science TV program *Bill Nye, The Science Guy* premieres.

September 13, 1848: Railroad worker Phineas Gage survives an accident in which a steel rod is driven through his skull. His post-injury personality changes were key to studying how the brain works and negating mind/brain dualism.

September 28, 1978: The death of Pope John Paul I just thirty-three days after his election spawns many conspiracy theories.

October 1, 1988: The U.S. Vaccine Injury Compensation Program begins operation; it is created after a series of lawsuits resulted in vaccine shortages.

October 1, 1993: A long battle between the Church of Scientology and the U.S. government ends when the church is granted tax-exempt status.

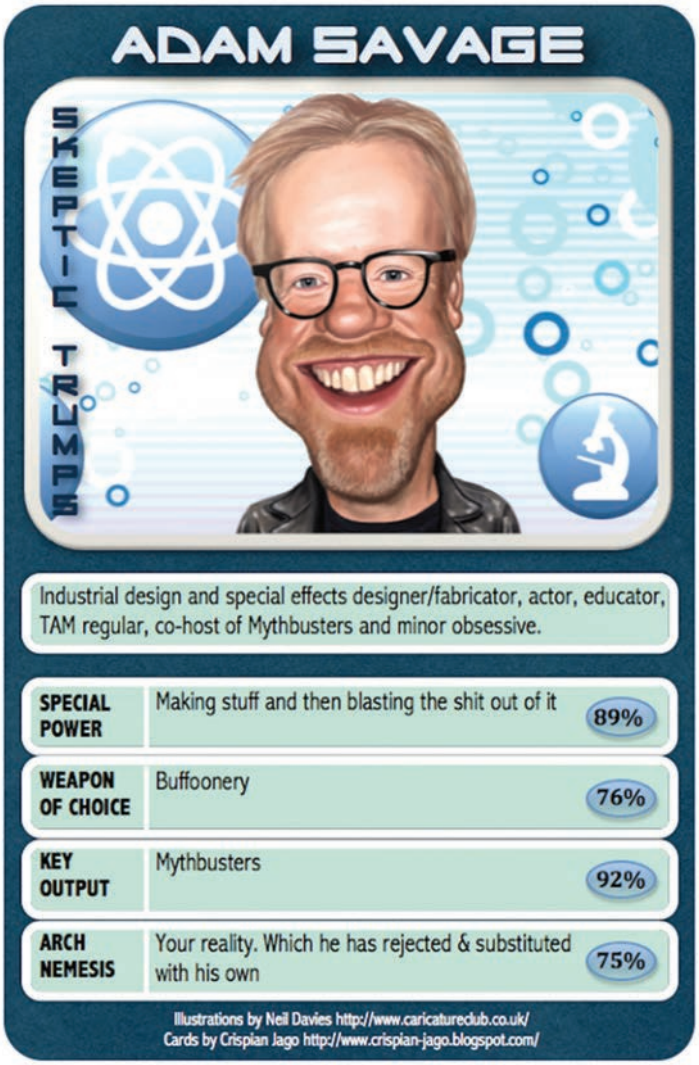
October 13, 1988: Archbishop of Turin Anastasio Ballestrero announces in a press conference that the Shroud of Turin had been dated to medieval times using carbon-14 dating.

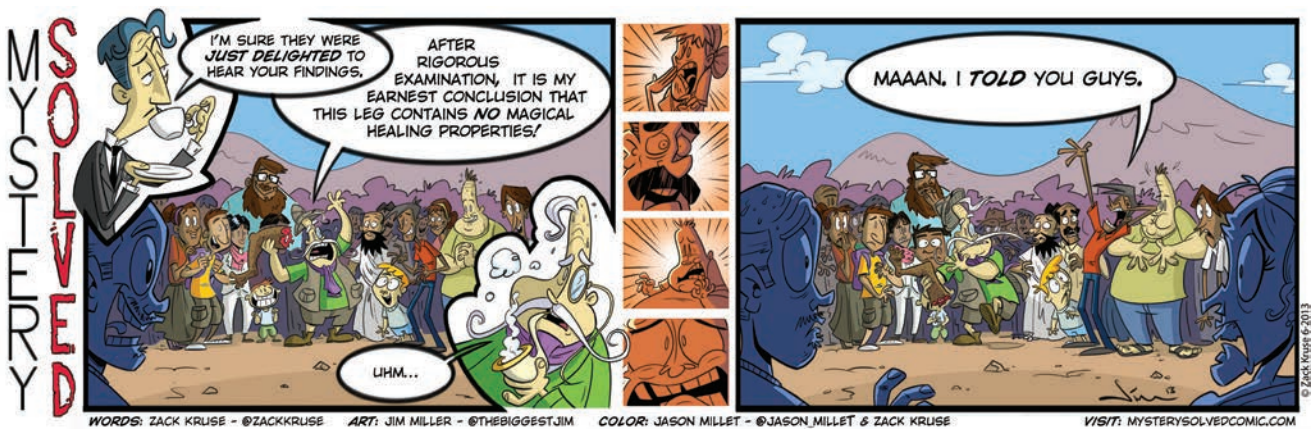
October 19, 1908: The Anti-Vaccine League of America begins its first conference in Philadelphia.

October 21, 1888: Margaret Fox confesses that she and her sisters faked the sounds heard during their Spritualist séances, partially by cracking their knuckles.

October 30, 1938: The radio broadcast of H.G. Wells's *War of the Worlds* by Orson Welles is thought by some listeners to be a real news event.

Tim Farley is a research fellow with the James Randi Educational Foundation and created the website whatstheharm.net.




MYSTERY SOLVED
I'M SURE THEY WERE JUST DELIGHTED TO HEAR YOUR FINDINGS.
AFTER RIGOROUS EXAMINATION, IT IS MY EARNEST CONCLUSION THAT THIS LEG CONTAINS NO MAGICAL HEALING PROPERTIES!
UHM...
MAAAN. I TOLD YOU GUYS.
WORDS: ZACK KRUSE - @ZACKKRUSE ART: JIM MILLER - @THEBIGGESTJIM COLOR: JASON MILLET - @JASON_MILLET & ZACK KRUSE VISIT: MYSTERYSOLVEDCOMIC.COM
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